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Telephony

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Guaranteed Circulation This Issue
14,105 of Which 10,625 is Paid

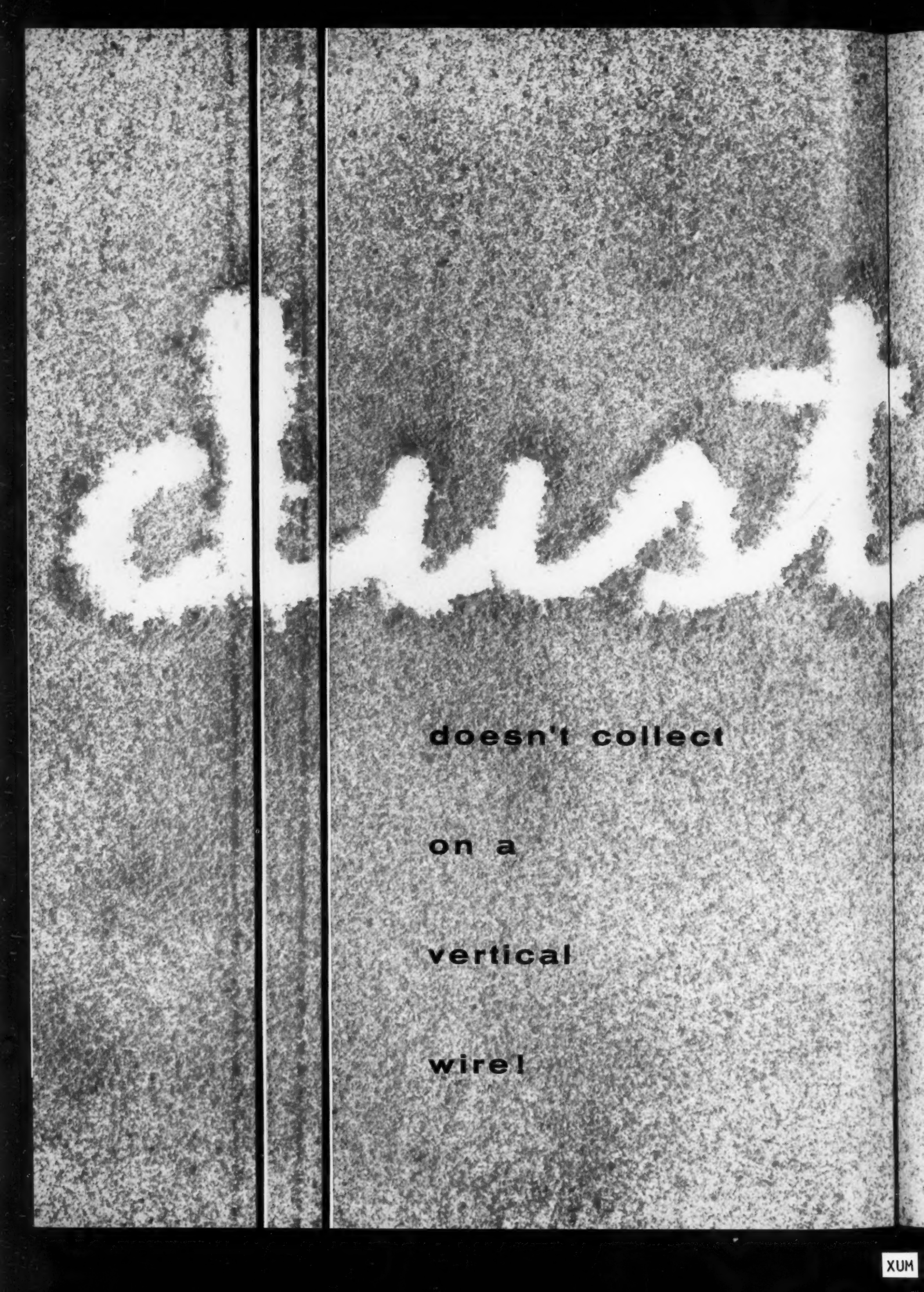
SPRING CONSTRUCTION—RURAL ISSUE

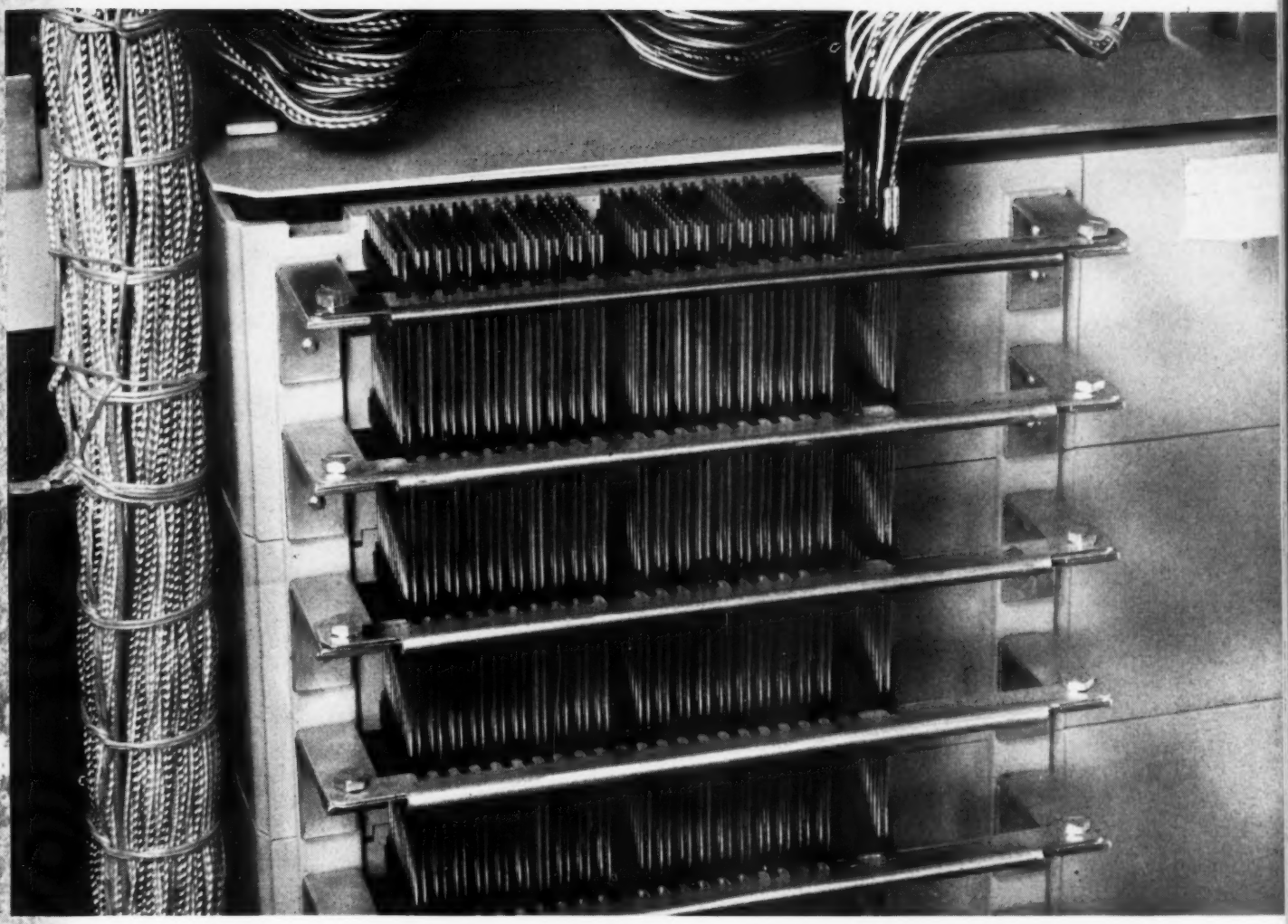
VETERAN AT 17

Pole-climbing offers no fears for 17-year-old Tommy Smelser who works outside school hours for his father's company, Northeast Texas Telephone Co. of Bogata, Tex., now carrying on a $600,000 expansion program. See p. 64.

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

XUM


doesn't collect
on a
vertical
wire!



Every XY® Dial System uses vertical multiple wire bank units, of nickel silver wire. You save cleaning costs, because dust falls through. And you save maintenance because dust-free wires don't foul up switching operation!

And here are 4 other reasons why an XY Dial System can save you money:

Famous XY Universal Switch can be used without alterations, as finder, selector or connector. Simple to install, remove, adjust or clean.

Twin contacts of precious metal give you 22.7 times as reliable operation as single contacts! And all contacts are *welded*—not riveted!

Back-to-back rack mounting of equipment saves you floor space in your exchange and provides easy servicing and easy expansion of the system.

Wipers also have twin contacts for more positive action. If any wipers should wear out, we'd replace them free of charge—but they won't!

Call on your nearest Stromberg-Carlson branch sales office for a brass-tacks discussion of *your* dial plans—and how to save money.

STROMBERG-CARLSON COMPANY

A DIVISION OF GENERAL DYNAMICS CORPORATION

Sales Offices: Atlanta 3, Chicago 6, Kansas City 8, Rochester 3, San Francisco 3.

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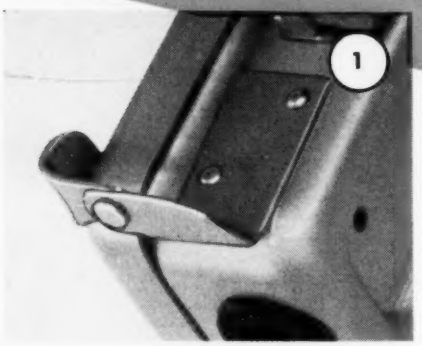
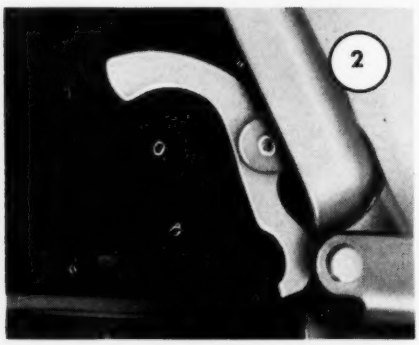
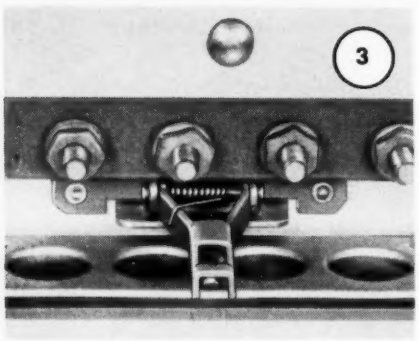
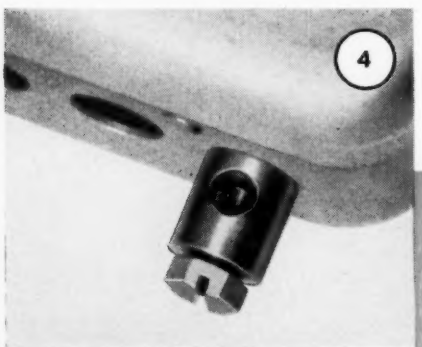
Stratoliner

FIRST SHOWING OF



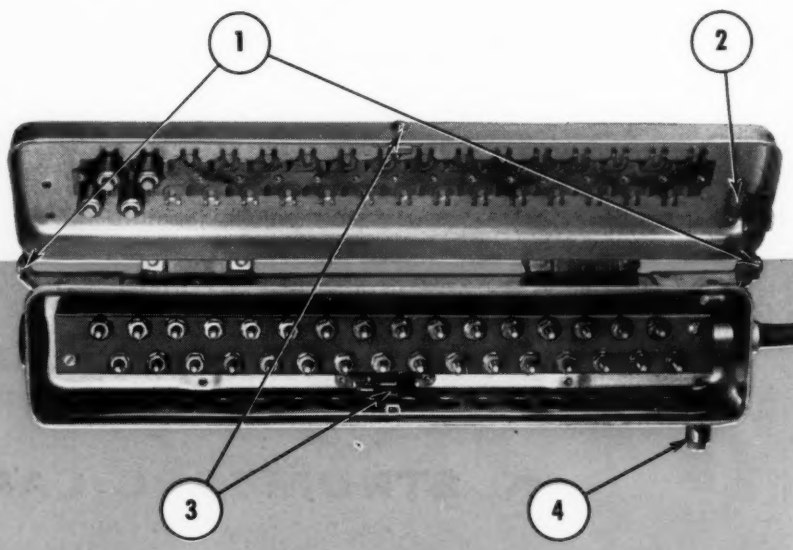






IMPORTANT IMPROVEMENTS WHICH THE 1957 MODELS WILL FEATURE

1. **WIDE ARC COVER HINGE:** Which makes interior of terminal more accessible for servicing. Hinges are of heavy stainless steel construction and reinforced.
2. **AUTOMATIC COVER STOP:** Which holds cover in fixed, open position while terminal is being serviced.
3. **PUSH BUTTON COVER LOCK:** Makes interior of the terminal readily accessible without use of tools and positively locks cover against impact or vibration.
4. **HEAVY DUTY GROUND STUD:** Conveniently located for outside wiring of No. 6 bare or insulated ground wire when applying protection.



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THE 1957 MODEL WITH IMPROVEMENTS FOR THE FUTURE

Distributors will soon be showing the new 1957 Stranterms in three new body styles, and capacities ranging through 6, 11, 16 and 26 pair sizes.

The new Stranterms are provided with an alodized, aluminum alloy, drawn metal body. Door latching members and cover supports are interior positioned. The doors are arranged to lift and set in a raised position while the terminal is being serviced. When ready to close, the latch is released, and the door is "pushed home" where it is rigidly locked. Inland Testing Laboratories tests show this terminal to be weather-proof and rain tight when deluged with water. The terminal is light in weight, easy to install and very convenient for connecting or changing drops. It is furnished with either lead or plastic stubs. Stranterm also features an ingenious bell shaped cable nozzle which eliminates cable breakage due to excessive right angle bends.

The Stranterm is the only Strand Mounted Terminal which may be initially installed unprotected and can later be protected optionally, on a pair by pair basis by the easy insertion of snap-in Minigap or Mytigap Arresters as determined by the outside plant engineers' requirements. We suggest that you try a Stranterm today and investigate the economies and improvements now made possible in your outside plant construction.

XUM

Give him the FINEST!

As a telephone man you and your company are dedicated to give the finest service possible. For that, you must have supplies and equipment that are of the highest quality.

That's where Leich, with its years of experience, can help you. We offer a complete line of products by famous manufacturers known throughout the Independent industry.

When you buy from Leich, you have the assurance that every item is fully guaranteed and has met rigid tests to prove its merits. Every new product is carefully investigated before being added to our line.

You can depend on Leich for prompt, efficient service. Your orders, large or small, are handled by folks well acquainted with the telephone industry and its needs. Next time you order, use the source that offers you prompt service and the finest in materials . . . Leich!

LEICH

in supplies too...

LEICH *offers the best!*

RELIABLE . . . HUBBARD . . . COOK

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. . . NICOPRESS . . . EXIDE . . . GOULD

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. . . AMERTEL . . . ATKINS

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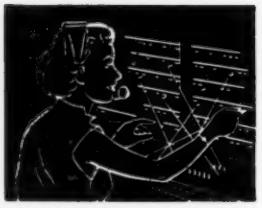
GENERAL SYSTEM INDEPENDENT



FLASHES AND PLUGS

UNLISTED ASSET. "Help! Police! Burglars! Thieves! Call the police!" rent the clear March night air in Chicago. Several persons living near the Michigan Electronics, Inc., plant, who heard these cries—uttered by a man and punctuated by the screams of a woman—did telephone police.

Arriving at the company's offices, police found no burglars, but they noticed a stream of water seeping from under the building's front door.

A talking burglar alarm was going full blast. Police investigated and discovered that it came from a record playing through a loudspeaker system.

A company sales representative said the record was electronically set to play after the office was closed any time that a human body passed within a foot of the firm's safe, filing cabinets or desks.

The alarm went off, he said, after a water pipe burst and sent a stream through the office. An electric current primed the talking alarm into action.

•

ALL IN ORDER. A telephone repairman was fixing the telephone of a businessman and when the repairs had been made, the repairman suggested that the man call someone to find out if the instrument were in working order again.

The man called his wife at home and when the connection was made, said: "Hello, dear."

A storm that had been gathering outside broke at that moment. The telephone wires were hit by a blinding flash of lightning and the man holding the receiver was hurled violently across his office.

When he finally rose to his feet in a dazed condition, he looked at the repairman plaintively.

"That's her," he declared. "That telephone works fine."

•

I SAY, AH YOU THEAH. The *Chicago Daily News* on Apr. 12 placed a person-to-person call to Grace Kelly at the royal palace, Monte Carlo, Monaco.

The usual voice with the smile dissolved into the voice with the giggle.

"You mean *the* Grace Kelly?" an operator asked.

When she stopped giggling, she was told, "Yes, *the* Grace Kelly."

The reporter suggested the operator in Monte Carlo probably would find the right number in the telephone book under "Grimaldi, Rainier, Prince, his Serene Highness."

The operator found the number all right—but the *Daily News* observed, "Just as can happen on a call to Blue Island or Hegewisch, the line was busy."

It remained busy for nearly three hours. Then, when the line was free, the palace operator at Monte Carlo said:

"Miss Kelly is not available. It is not known when she will be."

For readers interested, the call charge is $12, plus tax, for three minutes. And the number is Monte Carlo 1831.

CIRCULATION

Guaranteed circulation of this issue is 14,105 of which 10,625 is paid.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1904

April 28, 1956

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Telephone WA bash 2-2435

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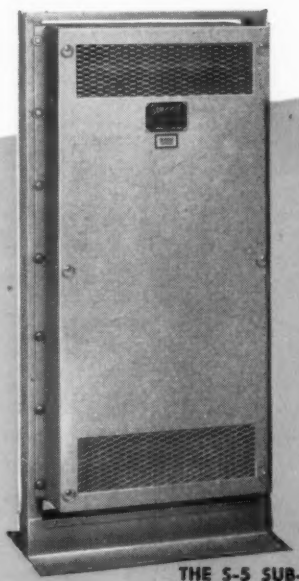
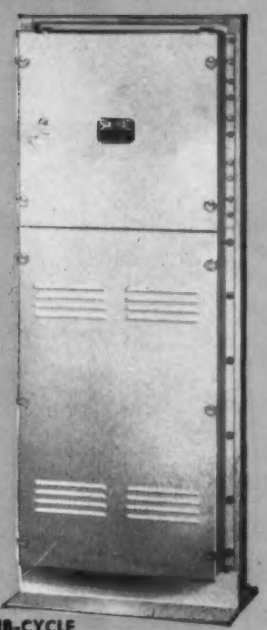
THE S-5 for SYNCHROMONIC RINGING
THE H-5 for HARMONIC RINGING
THE K-5 for DECIMONIC RINGING



THE S-5 SUB-CYCLE

With the introduction of the S-5 Sub-Cycle, Lorain now offers a complete line of multi-frequency ringing equipment. Each multi-frequency converter is true to the Sub-Cycle name and tradition in its freedom from moving parts, the positively locked ratio between the ringing frequencies and the a-c line frequency, the regulated ringing voltages, and the permanent, maintenance-free operation that Sub-Cycle users have learned to take for granted. Each Sub-Cycle utilizes circuits and principles of proven dependability.



THE H-5 SUB-CYCLE

The **S-5 Sub-Cycle** combines basic Sub-Cycle circuits with a unique conversion principle to give you a truly reliable converter for generating the **SYNCHROMONIC** frequencies, 30, 42, 54, and 66 cycles. When specified the model S-5 can be equipped to supply either 15 cycles or 20 cycles as the fifth frequency. **SEND FOR BULLETIN 169.**

The **H-5**, producing the output frequencies of 16⅔, 25, 33⅓, 50, and 66⅔ cycles, is an outstanding advancement in **HARMONIC** ringing machines because of the great operating advantages resulting from the perfectly stable ringing frequencies. **SEND FOR BULLETIN 166A.**

The **K-5**, which produces the **DECIMONIC** ringing frequencies 20, 30, 40, 50, and 60 cycles, was designed to meet the demand for a moderately priced static frequency generator to give five frequencies for selective ringing systems, and is applicable to new systems both large and small. **SEND FOR BULLETIN 157A.**

SOLD BY ALL LEADING TELEPHONE DISTRIBUTORS

THE K-5 SUB-CYCLE

FLOTROL
PARTNERS IN DEPENDABILITY
SUB-CYCLE

LORAIN PRODUCTS CORPORATION · LORAIN, OHIO

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MNO
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PRS
7
TUV
8
WXY
9
OPERATOR
0
NORTH

• the most advanced dial in the industry – exclusively NORTH

Original equipment on NORTH'S N-541 telephone, this NORTH dial sets new standards in dependability, quiet operation and simplicity of adjustment.

The extended dial plate is easier to read – ends "wrong number woes."

The simple gear train is made without worm gears.

In the large diameter governor the braking shoes lead into the drum, resulting in a smooth and positively controlled revolution of the dial.

Both the pulsing and off normal springs have double contact points.

An outstanding feature of the NORTH dial is its constant pulse ratio throughout the life of the dial.

The dial mechanism is completely enclosed in a dust-tight plastic cover.

As with all NORTH equipment, the NORTH dial is engineered and manufactured to meet the exacting requirements of the progressive independent telephone industry.

NORTH ELECTRIC COMPANY

601 SOUTH MARKET STREET • GALION, OHIO

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TELEPHONE CABLES

For Every Application

TYPE 144

AERIAL AND DUCT

Listed by REA, Type 144 cables are made in three sizes #24, #22 and #19 AWG. They are polyethylene insulated, aluminum tape shielded and jacketed with heavy duty Vinyl. Cables range from 6 to 202 pairs.

TYPE 150

AERIAL AND DUCT

A premium construction offering fully color coded, polyethylene insulated pairs. An .002" copper tape shield, and a hard service vinyl jacket. These cables are made in sizes #24, #22 & #19. Range 6 to 202 Pairs.

TYPE 190

AERIAL AND DUCT

Type 190 offers the excellent electrical characteristics of Polyethylene in the insulation and the jacket. The conductor assembly is aluminum shielded. Manufactured in #24, #22 & #19 AWG. Range 6 to 202 Pairs.

TYPES 160 & 162

SELF-SUPPORTING CABLE

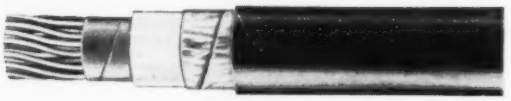
Type 160 with Copperweld conductors or Type 162 with hard drawn copper conductors are both insulated with Polyethylene. The pairs are fully color coded. A copper shield and tough vinyl jacket protects the assembly. Made only in #19 gauge in 6, 11, 16 & 26 pair cables.

TYPE 122

INSIDE TELEPHONE

PWC Inside Telephone Cables are vinyl insulated and jacketed. They feature fully color coded pairs and a Nylon Rip cord for easy stripping. Made in sizes #24, #22 & #19, range 2 to 101 Pairs. Brown or Ivory.

TYPE 166



BURIED

An excellent design for direct burial. Polyethylene insulated, fully color coded pairs. Pair assembly covered with extruded Polyethylene belt, Copper shield, and Vinyl Jacket. Range 6 to 101 Pairs.

TYPE 177

RURAL DISTRIBUTION

PWC Rural Distribution Wire is made in constructions from 1 to 16 pairs. Each conductor is insulated with polyethylene and jacketed with colored vinyl. Pairs are assembled around a 109-E steel messenger wire.

NO. 214 - RURALINE - NO. 212

INSULATED LINE WIRE

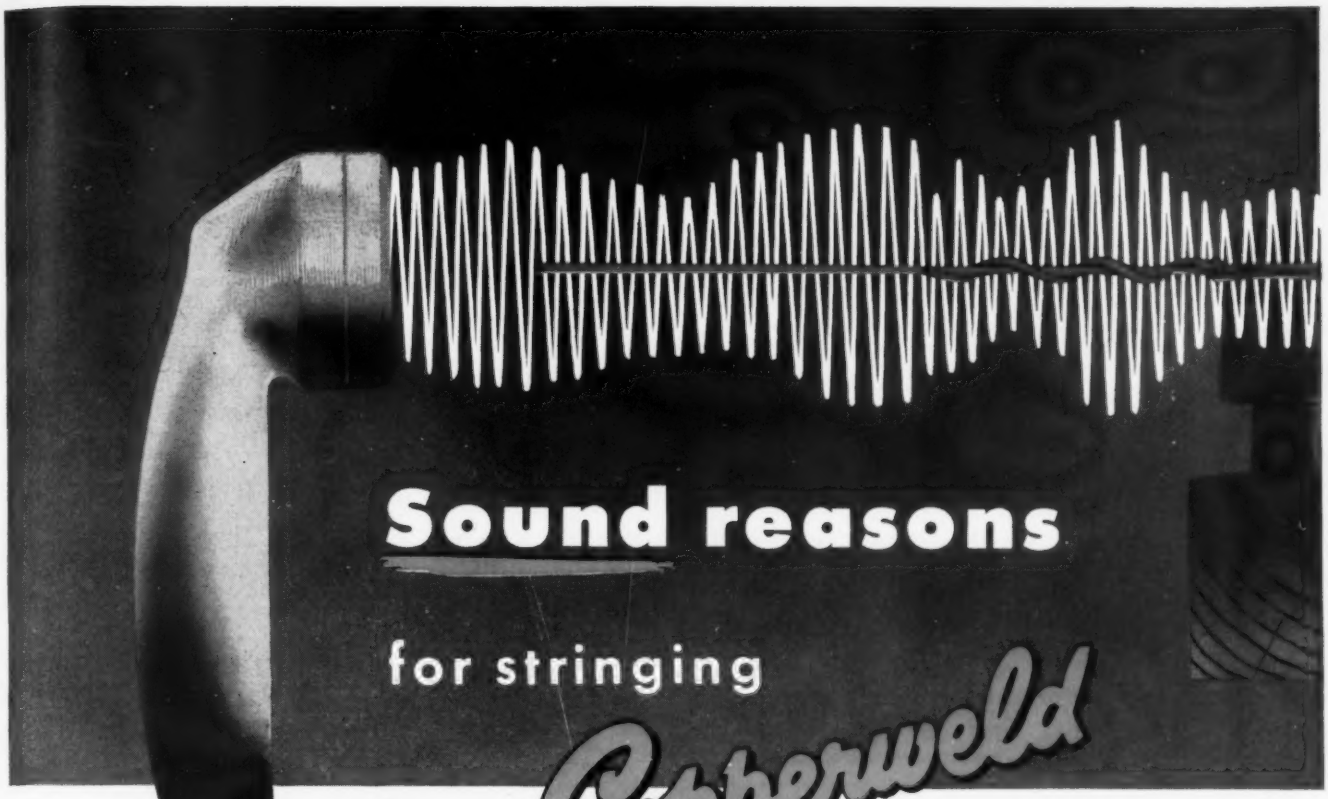
The new polyethylene insulated line wire designed for low cost rural service extensions. Two Copperweld conductors are insulated in parallel. Size #14 is identified as No.-214, size #12 as No.-212.

OTHER PWC TELEPHONE PRODUCTS

There are many additional products manufactured by PWC for the Telephone Industry. In addition to the complete line of thermoplastic inside telephone wires, Urban and Long-Span distribution wires, many custom cables are manufactured to customer specifications. For additional information or for special cable engineering contact your nearest PWC distributor or write direct to the Plastic Wire & Cable Corporation.

PLASTIC WIRE & CABLE CORPORATION

JEWETT CITY, CONN.



Sound reasons

for stringing

Copperweld TRADE MARK non-rusting Line Wire

- Copperweld* Line Wire "talks better" than any other high-strength conductor, due to its thick, molten-welded copper covering.
- Copperweld retains its high transmission efficiency permanently, because it can't rust.
- Copperweld is the only long-span conductor suitable for carrier. When you build with Copperweld, you can convert to carrier circuits, when required, without additional investment in overhead lines.
- It's sound reasoning to use Copperweld, the best engineered wire for voice, signal and carrier circuits.

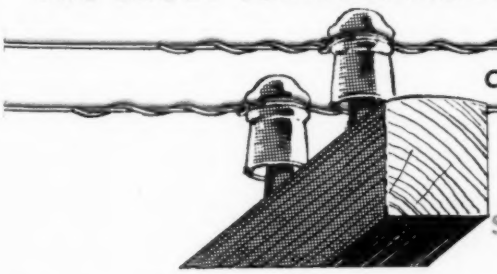
*Trade Mark

COPPERWELD STEEL COMPANY

WIRE AND CABLE DIVISION *Glassport, Pa.*

For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

the ideal combination...



COPPERWELD LINE WIRE and GRIP-FLEX INSULATOR TIES

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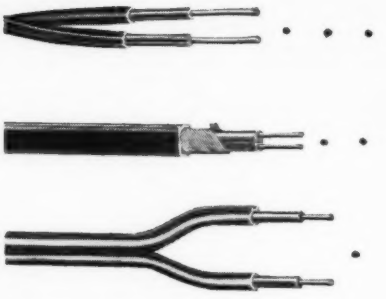
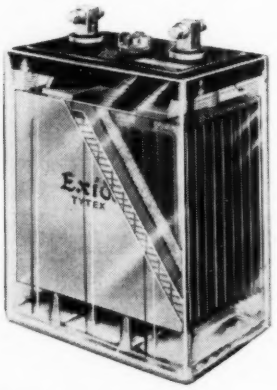
Fine Telephone Poles. Dierks Pressure-Treated Southern Pine Telephone Poles, up to 110 feet. Creosote or Penta treatment. Prompt shipment out of stock. DIERKS FOREST, INC.



Afraid of Winter? Keep your lines in action — your maintenance costs down, with DIAMOND WIRE & CABLE CO.'s RED-D Drop Wire. Superior adhesion, conductivity, tensile strength. Available in Copperweld and Signal Bronze.

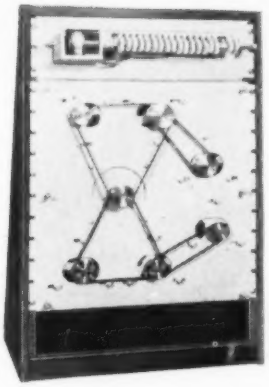
Kellogg's Standard Outside Plant Handbook now available at special price while quantities last. Reduced to $2.75 a copy with ten or more copies priced at $2.50 each. Every phase of outside plant telephone pole line construction is covered in book.



More Power, Less Space—the Exide-Tytex battery requires only one half to two thirds of the space needed by the conventional cell. Permits smaller racks in new installations. Exide Industrial Division, THE ELECTRIC STORAGE BATTERY COMPANY.

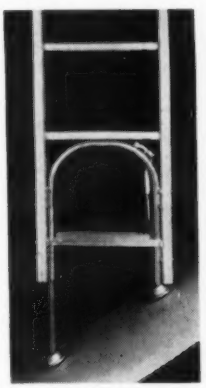
A GALLERY OF MASTERPIECES OF FINE LINE EQUIPMENT

Versatile Plastic Screw Anchor meets needs of telephone industry. For use in all materials from plasterboard to concrete, indoors and out. Outstanding bonding and fusing action. No special tools required. Savings up to 70%. HOLUB INDUSTRIES, INC.



25 Watt Multi-Frequency Ringing Panel. Available for stand-by operation. May be equipped with tone generator and motor-driven interrupter. 19" Or 23" rack mounting. HOLTZER-CABOT TELEPHONE EQUIPMENT DIVISION, National Pneumatic Co., Inc.

"Prospector" Earth Boring Machine! Extra rugged construction — Digging Bar angles to right, left, or forward. Angles better than 45°. Priced in the low-priced field. Ask for a demonstration! WYOMING VALLEY EQUIPMENT.



Ladr-Levl, a leveling safety device for extension A-frame and straight ladders. Fully mechanical, keeps your ladder always level on slopes, steps, irregular surfaces. Levels instantly, locks automatically. Interchangeable feet available. Made by H-B INDUSTRIES, INC.

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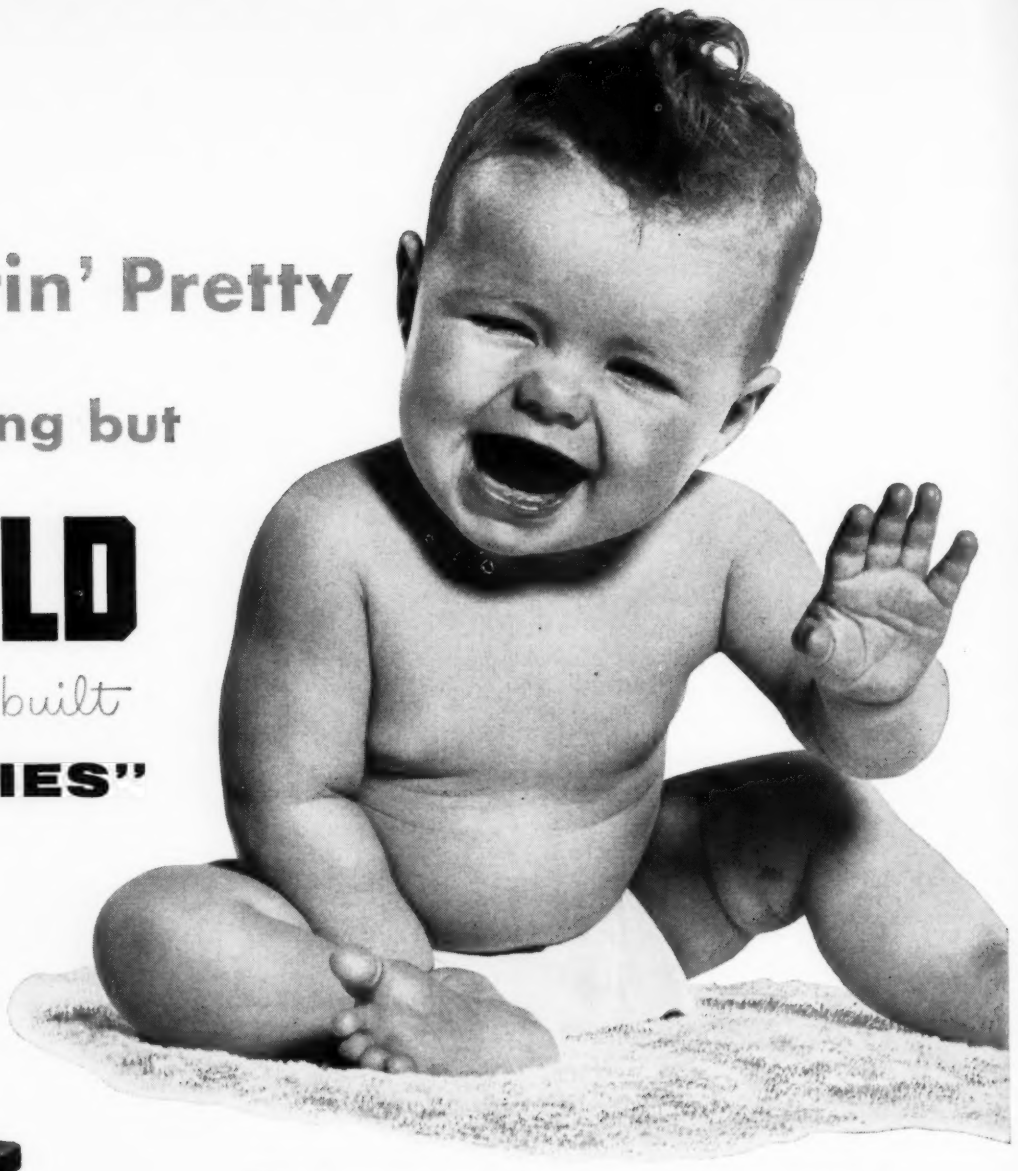
"I'm Sittin' Pretty

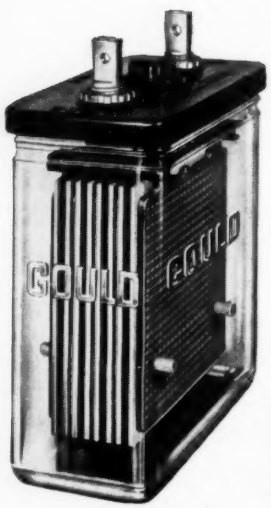
use nothing but

GOULD

Research-built

BATTERIES"





America's Finest!
GOULD PLANTÉ
The Aristocrat of
Stationary Batteries

There are three big reasons why it pays to choose Gould Research-Built Batteries:

1. They are the finest batteries modern science can give you—research-built for longest service life.
2. Strategically located Gould plants assure prompt attention to your battery requirements.
3. Gould Field Engineering Service, finest in the industry, nation-wide in scope, is as close to you as your telephone, always ready to see that your batteries are properly cared for and maintained . . . that you get maximum battery performance.

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PUBLIC AUDITORIUM
JUNE 5th THRU 8th
1956
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EXHIBITOR
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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

Roosevelt's demand for investigation of Bell System relationship to Eisenhower administration might bring some kind of a probe because of Democrats' lack of political issues in election. House Committee votes reimbursement to utilities for relocation costs in Federal Aid Highway Bill proportionate to federal funds spent on highway projects as a whole.

IT IS TOO EARLY to say just what will come of Rep. James Roosevelt's (D., Cal.) demand for an investigation by the House of Representatives of the Bell System and its relationship to the Eisenhower administration. "Jimmy's" speech on the floor of the House on Apr. 16 should have been of no surprise to regular readers of this department. It followed the pattern previously outlined in these pages; namely, denouncing the recent consent decree between the federal government and the American Telephone & Telegraph Co. with respect to Western Electric Co.

Representative Roosevelt called for an investigation of Bell System influence on the present administration, particularly with respect to the Defense Department, the Air Force, the Federal Communications Commission, the Office of Defense Mobilization, and the Justice Department. He named 29 alleged "officials or directors" of AT&T or subsidiaries who have held jobs in federal agencies under the present administration.

As to whether there actually will be any further House action on Roosevelt's demand for an investigation, the chances now seem to be in favor of some kind of a probe. But to what extent and by what committee is problematical.

Representative Roosevelt was firing off in so many directions in the same speech that such a probe could easily invoke the jurisdiction of four standing committees of the House if a motion for investigation were to be seriously considered. The only way to get all of these different angles into the same investigation would be by the appointment of a special investigation committee. That is an unusual step and is not likely to be done in this case.

Yet, Representative Roosevelt would hardly have made his speech without some measure of clearance by the House majority leadership. Right after he had finished his statement on the floor of the House on Apr. 16, the House majority leader, Representative McCormack (D., Mass.), signified his approval of Roosevelt's speech, if not all of Roosevelt's objectives. This suggests that a plan may actually be in existence for carrying on the probe.

The most likely vehicle is the House Judiciary Committee, headed by Representative Celler (D., N. Y.). Celler's committee has already been active in cross-examining the various regulatory commissions with regard to the effectiveness of their operations relating to business enterprises.

Furthermore, Chairman Celler promises that his committee would investigate at least the consent decree because that is within the province of his committee which has jurisdiction over anti-trust and monopoly matters. Furthermore, the House Small Business Sub-committee, of which Representative Roosevelt is chairman, does not have authority to write legislation.

There is one other House committee which has expressed interest in the speech—that is the House Government Operations Committee, headed by Representative Dawson (D., Ill.). Dawson said he is also looking into the AT&T's consent decree. So far, no decision has been made by Dawson's committee and no hearings will be held until a staff study is completed.

Assuming that an investigation is made, what will be the outcome? Unfortunately, in an election year, surcharged with an atmosphere of politics, no constructive legislative results are likely. Indeed, a realistic appraisal of the situation suggests that no such results are even expected. Representative Roosevelt thinks he has discovered a good political horse to ride and the majority leadership is evidently disposed to let him go ahead and see what he can do.

If the congressman from California comes a cropper, there is no harm done as far as the party's position is concerned. But if he can turn up any kind of a debatable issue upon which a political appeal can be based during the campaign, his colleagues will be very grateful. Political issues are becoming scarce with the Democrats. So, it may be that the public utility industries, with the Bell System included, will be selected, by default of anything more interesting, to fill the gap of much needed campaign material. This is hardly good news for either the telephone industry or any other public utility industry. But it has been done before, and it will probably be done again.

On the broader, long-range problem of monopolistic development in the telephone industry, not much light will be shed. There are some important basic questions of broad government policy which could well be examined, in this field, in a calmer atmosphere by a more objective committee than Chairman Celler, Representative Roosevelt, or others of like mind are likely to produce. Such basic questions as: (1) Whether large corporate size should be regarded as wrong in itself; (2) whether lines against further expansion should be drawn, or (3) whether further territorial development should be allocated. These are just three samples which a more dispassionate congressional investigation might consider.

But even conceding that the House investigators will not be objective nor

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dispassionate, they will still have some questions to ask of both Bell System and Independent people about the internal structure and organization of the industry as a whole. And such questions may have to be answered. It is not too soon to be thinking about the answers. The questions may come sooner than is generally expected.

FCC Volume Rate Case

Speaking of investigations, the FCC will have to broaden its case of investigating proposed "volume rate" private line tariffs. The reason is that the Department of Defense has asked permission to intervene in the commission's general investigation of the private line services furnished by telephone companies. The FCC hearings will probably not commence until Fall, but they will embrace private line service tariffs (other than television and sound broadcasting) of all Bell System companies as well as Western Union.

These include such services as private line telephone, teletypewriter, telephotographing, remote telemetering, and miscellaneous signaling. The Defense Department said that it proposed to expand its leased services in connection with its SAGE project of air defense communications, and was greatly concerned with any proposal for reduced rates for multiple private line services.

Highway Bill Progressing

Public utilities won their point by a fairly large margin in the House Public Works Committee on the question of whether the Federal Aid Highway Bill should include a provision to reimburse telephone companies and other public utilities for the expense of relocation of lines, pipes, and other facilities due to highway construction. The full Public Works Committee had voted, 19 to 8, to permit payment of the cost of relocating utility facilities along future federal-aid highways in the same proportion as federal funds are spent on the projects as a whole.

An amendment to the Fallon Bill (H.R. 8838), proposed by Representative Dondero (R., Mich.), was somewhat more restrictive than that passed by the Senate in the Gore Bill (S. 1048), still pending, and defeated during House consideration of the first Fallon Bill last year by a 125-to-75 vote.

The Gore Bill authorized a flat payment from federal funds of up to half the cost of relocation, provided that reimbursement would not exceed 2 per cent of the project costs.

Dondero's amendment in the House bill would only allow federal fund reimbursement to the proportion actually practiced by the state, if any. The state practice rarely permits reimbursement of as much as 100 per cent of relocation costs.

After the full House Public Works Committee approval of the entire bill, containing the limited reimbursement language, was obtained, House Majority Leader McCormick said the bill would come up for floor action towards the end of this month—probably around Apr. 26. The outlook for the relocation provision is still uncertain, however.

Judging by past experience and by the immediate propaganda reaction unleashed by the opposing highway lobby, another floor battle is in prospect.

The highway bloc (seeking to restrict use of funds to direct highway building expense) is trying to rally a revolt against the politically sensitive utility relocation provision by putting out arguments that it is a "utility raid" on the Treasury. This technique was successful last year.

In addition, the controversial nature of the highway program itself, especially financing provisions, could indirectly cause the elimination of the utility section during behind-the-scenes bargaining for votes.

Slowed down by time-consuming amendments, the multibillion-dollar long-range highway bill will go before the House shorn of one of its controversial features, the Buckley amendment, to reimburse states for toll roads made a part of the interstate system.

Who are the people opposing the utility relocation provision? It is a conglomerate group: state highway commissioners, congressmen from so-called "tourist states" (such as Florida), manufacturers of cement, earth-moving and other road-building equipment, and others. Their idea is to fight against the diversion of every dollar in this highway bill which is not actually spent directly for highway construction. They figure that, in that way, the federal funds will build that many more miles of highway; whereas reimbursement to utilities would leave a little less in the funds for direct road building.

The unfairness of the propaganda which the highway bloc is leaking out to a number of gullible newspapers is very discouraging from the standpoint of public utilities. The relocation provision has been widely condemned as a "grab" or a "giveaway" to utility interests—as if utility company management could somehow divert these reimbursement funds into dividends for utility company shareholders.

The true fact, however, is that it is the utility *consumer,* not the utility investor, who stands to suffer first and foremost if the reimbursement provision is thrown out of the bill. In other words, it is not an issue between highway user as against utility investor. It is an issue between *highway user* as against *utility consumer.*

When a utility company has to lay out money for relocating facilities, it represents either an operating expense or a plant investment. Either way, it has to be paid for by the utility consumer in his rates for service, unless, of course, it is reimbursed as part of the project out of highway funds.

And since moving a utility pole line or pipeline to make way for a highway is just as much part of highway expense as paying for the right-of-way or for the cement or other construction materials and services used, it should be a matter of simple justice to require that the highway user, rather than the utility consumer, should pick up the tab. But the highway bloc chooses to ignore these plain equities. The highway people prefer to talk about the "utility raid."

Indeed, one widely syndicated newspaper story even put the finger on the American Telephone & Telegraph Co. for taking the lead in seeking to have this relocation provision included in the highway bill. If true, it is a leadership of which the telephone organization can be proud. It means that the telephone group is vigilant in protecting its subscribers' interests against what would actually amount to a "raid" on their pocketbooks, by those who will use the highways after they are built.

There is a propaganda opportunity here for all the utilities (incidentally, both publicly and privately owned) to dramatize their defense of consumer interest. But the propaganda offensive, so far, has been pretty well monopolized by the highway bloc—and unfairly so, as the foregoing description of the highway people's arguments plainly shows.

A key feature in the House bill is a proposed 40,000-mile interstate highway system which would cost 27.5 billion dollars and link most state capitals. The federal government would pay 24.8 billion dollars or 90 per cent. The state share would be 2.7 billion dollars, or 10 per cent.

The program also calls for a federal outlay of 11.3 billion dollars over the 13-year period to help the states build primary, secondary, and urban roads on a 50-50 matching basis. This is 2.2 billion dollars more than would be spent at the current rate.

The committee approved without debate a financing system approved previously by the tax-writing House Ways and Means Committee. It would raise

(Please turn to page 85)

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Plowing In Buried Telepho for Urban and Distributo

By Martin J. Luichinger

THERE'S nothing new about the idea of placing telephone cables and wire underground except the methods and tools that are now being used. The latest method now under trial is a power-driven plow capable of burying cable or wire in one operation.

Plowing telephone cable and wire directly into the ground opens the way to new low-cost construction and gives a much more trouble-free type of plant and considerable savings in maintenance.

The economies of burying telephone plant directly in the ground was recognized some 30 years ago when lead sheath exchange cable was buried by ordinary hand-digging operations. Some of this cable was placed in trenches averaging around 14 inches in depth with no special protection.

However, in cases where there were suspicions of probable corrosive action, or where the cable sheath was questionable, a tar paper trough was formed at the bottom of the trench in which the cable was placed and covered with pitch, with the ends of the tar paper folded over the cable and the trench back filled. Some of this cable is still in service.

This type of construction was also accomplished by using an ordinary horse-drawn plow to make the trench. In addition to cable, paired wire was sometimes buried to meet short rural service runs.

In the course of time, due to increasing labor costs combined with the slow production rate of the initial construction methods, the economies of this type of construction gradually diminished to the point where it was no longer favored over aerial construction. Obviously, under present-day conditions, like many other functions in our ever expanding economy, machine operations are a must if the challenge of adequate high-grade service at reasonable rates is to be consistently and economically achieved.

Over the past 15 or 20 years, several noble attempts have been made in the direction of mechanizing direct plowing methods with considerable progress recorded in the matter of plowing and trenching in large toll cables. However, this is not true for exchange and rural plant where in many instances a small number of facilities are involved, e.g., one and two pairs of wires.

The development of wire placing plows separately propelled has been fairly successful, but the result did not meet expected service requirements. Insects, termites, rodents and lightning played havoc with the early type of underground wire, thus causing considerable concern as to the advisability of this type of construction at that time.

First cost, of course, is of prime consideration in building new telephone plant, but service objectives and associated maintenance, the basic contributions to the plant managers' ulcers, called a temporary halt to this work, pending the development of better

Mr. Luichinger was formerly Outside Plant Coordination Engineer for the Indiana Bell Telephone Co., Indianapolis, Ind. On Mar. 1, he was assigned as Coordinator of Defense Activities of the company. During the late war he was a lieutenant colonel in the Signal Corps and handled numerous special communication activities for the Chief Signal Officer. For his outstanding performance he was awarded the Legion of Merit Medal for his work in developing a world-wide secret radio-telephone system and the Bronze Star Medal for the rehabilitation of the telephone system in Manila. He was also awarded the following service medals: American Campaign Medal; Asiatic Pacific Campaign Medal with four bronze battle stars for participating in the New Guinea, Western Pacific, Southern Philippines, and Luzon Campaigns, World War II Victory Medal; Foreign Service Medal and the Philippine Foreign Service Medal. He also served as the Chief Signal Officer's representative on Admiral Blandy's staff for communications associated with Operations Crossroads, the atomic test at Bikini Island.

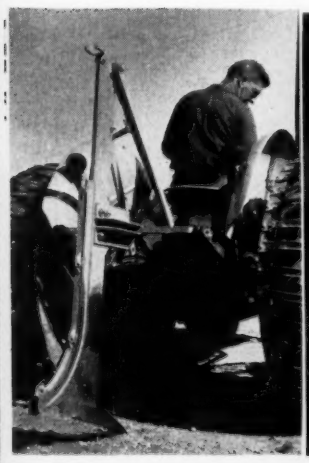

Fig. 2. Plowshare; cable-wire laying tube.

Fig. 3. Plowshare with the tube side plate removed.

Fig. 4. Plow making a preliminary cut in gravel road.

Fig. 5. Plowing in wire after cut. Arm in front picks up wire ahead of tractor.

bone Plant
ution Cables

Fig. 1. Ferguson plow unit showing plowshare coupling and original modification of the plowshare.

materials along with further improved construction methods and tools.

Buried construction methods, both plowing and trenching, involving toll cables, have enjoyed considerable progress. This type of construction is usually over private right-of-way and placed considerably deeper (40 to 42 inches) with heavy duty and much more costly equipment.

Construction costs, associated with slow moving trenching machines and back filling operations, together with the direct plowing method using heavy duty plows sometimes requiring three heavy duty tractors in tandem, for motive power, are easily absorbed by the over-all savings in cable and repeater stations made possible by utilization of straight line routes over private right-of-way.

Building urban and rural distribution plant is quite different. This type of plant must be along the highways where the customers are. The cost of heavy construction equipment for this class of plant obviously cannot be justified. Also, it would be impractical to traverse most of the county roads with this type of equipment without inflicting objectionable roadway damage, necessitating costly road repairs.

This brings us to the present-day problem of meeting the expanded plant demand at a cost commensurate with reasonable rates which must, of necessity, take into account low initial costs and over-all operating charges, of which maintenance is the principal item.

On the basis of past experience, underground plant is definitely the answer, particularly from the standpoint of maintenance. The problems of road clearances, power-crossings and burns, joint construction, lightning, trees, and bullet holes are a thing of the past.

It is true that underground plant is subject to some difficulties such as electrolysis, low frequency power disturbances, heavy electrical storms, digging by foreign workmen, but in weighing the over-all maintenance considerations, these are in the minority category.

In an engineering analysis of the over-all economic aspects of buried versus aerial plant, as mentioned before, the item of first cost is given a lot of weight. In the case of buried plant which excludes the cost of poles and anchors, placing labor is of paramount importance. Therefore, the real economy lies in the method of placing such as with a low-cost, effective power-driven tool.

With the recent improvements in the quality of materials available for burying, many companies throughout the country have been experimenting with buried construction, employing various

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Fig. 6. Rear view of tractor plowing in wire to full depth.

Fig. 7. Tractor loaded on trailer for transporting to the job.

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THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITOR

TO THE BEST of our knowledge, the first installation of telephones for use of customers at drive-in restaurants was recently placed in service in Oregon. It is reported that the telephone reduces the work of the pretty carhops by half. A one-position, 10-line keybox and a two-way intercom loud speaker is installed in the kitchen where the orders are taken. This central equipment is connected to 10 hanging handset telephones each located on a post, midway between two parking spaces in the parking area.

The system works in this manner. A customer drives in and parks. He lifts one of the handsets and a lamp lights in the kitchen and a buzzer sounds. The kitchen attendant flips a key and inquires through the speaker, "What'll you have?" The order is relayed to the cook and when it is ready is delivered by a carhop to the customer's car. In this way, only one trip per order is required of the carhop instead of the usual two.

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According to a farm engineer of the University of Maryland, water pipes are not very effective in grounding electric wiring systems. Normal drinking water with low mineral content is itself only a fair conductor and, with the introduction of plastic water lines in many farm systems, it becomes completely inadequate as a ground connection. The only safe practice, according to this specialist, to to keep ground wire away from water pipes entirely on farms, and run all ground wires to a common driven ground rod system.

•

The autodialer and the "no hands" speakerphone have taken most of the manual labor out of telephoning. Perhaps it is about time for the pendulum to start swinging back and we would not be surprised if someone would design a simple machine to convert speech into mechanical action. Then we would be able to speak a number into a dial system and get a connection in the old manual manner. This would undoubtedly have great appeal to the younger generation.

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Recently we noted that the telephone was locked up in a small place of business and inquired as to why this was necessary. The owner stated that he was forced to take this action or go bankrupt.

In the office where the telephone was often left unattended for a considerable length of time, customers and others wandered in and were not bashful in using the telephone. He did not object to local calls—or even to the extra-unit calls—but toll calls began to appear on his bill that he could not identify. The low cost toll calls did not "hurt," but then one costing $12.00 appeared, so he locked up the telephone.

As the use of direct distance dialing increases there will undoubtedly be more telephones placed under locks for the protection of the party who must pay the bill.

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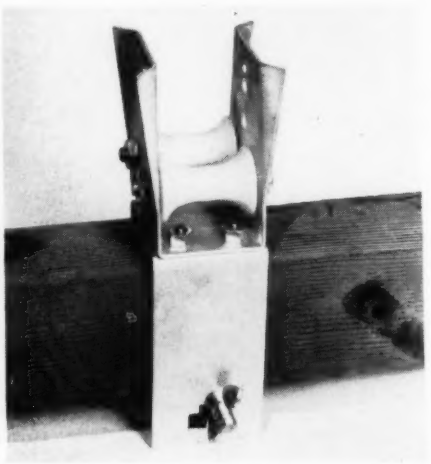
A new type of sturdily built lightweight and adjustable wire and cable stringing block is now available and is



adjustable to fit all standard crossarms. The blocks are equipped with tough nylon rollers. The extreme toughness of nylon, plus its abrasion resistance which is far superior to that of metallic bearings, assures a longer life under adverse service conditions. Nylon bearings may be operated either wet or dry (see cut).

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Reverting to the earliest known method of overland transportation in the far north, the United States Army Corps of Engineers, rushing to complete a project on schedule, is depending on dog teams to get men and equipment to remote and almost inaccessible sites for future military construction in Alaska for the White Alice project.

Since early January, civilian engineers with the Alaska District have been surveying and taking soil samples in many scattered regions in Alaska where the dog team is the only means of crossing the windswept wilderness of snow-covered tundra.

Fifty engineers and surveyors, together with native Eskimo and Indian mushers and laborers are involved in the project, collecting data for use in the design of White Alice communication stations.

This investigative work has been carried out under the severest of weather conditions. These crews faced tremendous winds and sub-zero temperatures in order to accumulate the design information early enough for construction to get underway this spring.

White Alice is a communication system comprised of a series of repeater stations built across Alaska to support the early warning radar system.

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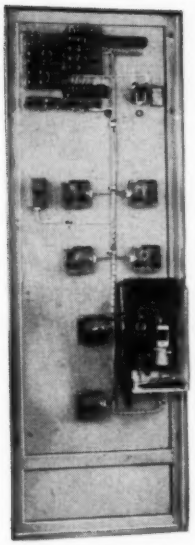
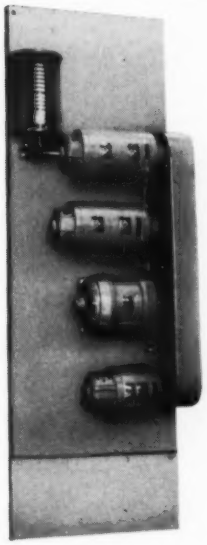
A recently developed transistorized device clips over the receiver of any telephone and claims to amplify signals up to seven times. The received signals are picked up by magnetic induction,

ESCO RINGING EQUIPMENT





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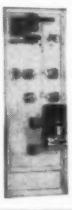
Here are two big points, typical of the practical considerations that go into the design of all Esco ringing equipment.

For new installations, conversions, or expanding present facilities, Esco vertical mounting, plus factory prewiring mean big savings in floor space and installation time and expense. These compact vertical assemblies fit standard rack installations for more efficient station arrangement and neat, modern appearance. Prewiring brings all exterior connections to a single terminal box for convenient connection to power and signal circuits. Color-coded lead identification is used throughout to make inspection or any later wiring changes quick and easy.

Before you make any commitments on new equipment, get the full facts on Esco vertical mounted - factory prewired assemblies. You'll see for yourself why so many equipment engineers and suppliers choose ESCO. Send for free brochure today.



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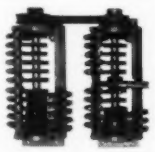

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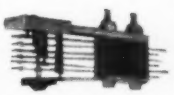

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ADDITIONAL ESCO FEATURES (details in future ads in this series) explain why ESCO components are included in the installations of prominent suppliers like Automatic Electric Co., Federal Telephone and Radio Corp., Kellogg Switchboard Supply Co., Leich Sales Corp., Stromberg-Carlson Co.

ELECTRIC SPECIALTY CO.
176 South Street, Stamford, Connecticut

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amplified, then converted into sound. Amplification is obtained by the use of three hermetically sealed transistors. Miniature mercury cell batteries provide the power and it is stated that they will last about a year. The complete unit weighs only 3 ounces.

•

A novel device for use in locating leaks in underground telephone cable has been developed under the direction of Paul E. Anderson by the Cable Group of the Communication Section of the Department of Water & Power of the City of Los Angeles, Cal. When telephone cableman Don J. Nordstrom

recently attempted to introduce gas into a 700 foot section of 51-pair plastic underground cable, he soon determined that it contained a leak.

The leak detector devised consisted of a carbon microphone attached to a "snake" or fish tape. This unit was pushed into the duct with the cable to a point where the hissing of the escaping gas reached maximum volume. The microphone was connected to a listening device by a small pair of wires pushed into the duct with the snake (see cut).

This item was furnished by Milton I. Ravich, communications superintendent.

•

We recently obtained an old wall type magneto telephone, refinished and mounted it on the wall of the Blain's rumpus room. Needless to say, it has attracted the attention of everyone who has seen it. To the older visitors, it is a little like meeting an old friend, and to the youngsters it usually proves to be quite a curiosity. Some of these young visitors will not believe that it was ever actually in service.

Later on, we hope to install a small speaker in the battery compartment and use it to furnish background music. Perhaps we can hide the speaker in such a manner as to make visitors wonder where the music is coming from.

Plant Man's QUIZ

BY RAY BLAIN, TECHNICAL EDITOR

Q. Would you please tell us what type of steel wire is recommended for use on an extra-long span on a rural line for a river crossing?

A. We suggest that you consider the use of HTL-190 Extra High Tensile Telephone line wire. This wire is No. 12, B.W.G., with a nominal diameter of 0.109 and a minimum breaking strength of 1800 pounds.

•

Q. It has been common practice with our company to attach an exploring coil on a pike pole so that a man walking on the ground and wearing a headset can locate trouble in aerial cable. Now we have learned that several men have been electrocuted with such an arrangement when it comes in accidental contact with power wires. Is this true, and if so, is there any way by which this testing method may be used with safety?

A. We have also received several reports telling of serious accidents being caused by using the cable testing method you mention. It is believed, however, that in all such cases an improvised test set was being used.

We understand that there is testing equipment on the market at the present time which is properly insulated so that the user will be safe if ordinary precautions are observed.

•

Q. We are planning a job where we expect to plow in several miles of cable on a rural line and would certainly be pleased to know the depth at which it should be buried in order to insure its safety.

A. The most practical and economical depth to use will depend to a great extent on the plowing equipment available, soil conditions and other factors that must be considered.

There was a time when it was considered necessary to bury all cable to a depth of 30 inches to insure its safety. Some operating companies in later years, in order to take advantage of locally available equipment, have placed buried cable to a depth of 14 inches to 19 inches. However, this cable has not been in service for a sufficient period of time to determine whether or not the shallower placing will result in a greater maintenance cost.

•

Q. Will the splicing of long poles prove satisfactory in this day and age? If so, how should this task be undertaken in order to prove satisfactory?

A. When extra-long poles are required to meet any special condition, splicing is always justified. Not only is long timber difficult and expensive to obtain, but it is also costly to transport.

The poles should be matched in size as nearly as possible at the point where the splice is to be made. The two poles should then be sawed to a matched taper with an overlap of about 7 feet.

The two sections are then held together by about six through-bolts equipped with curved washers and four clamping bands.

This method of splicing has been used for many years by telephone and power companies and in general has proved entirely satisfactory.

•

Q. We hear a lot these days about telephone station protectors losing their effectiveness because of a high resistance ground connection. Just how high may the resistance be on a protector ground before the danger point is reached?

The resistance of a protector ground should always be as low as practicable and in no case should it exceed 25 ohms. One reader informs us that a recent check of his grounds indicated that they measure from 10 to 1500 ohms.

It is a sad, although very true, fact that often a short ground rod is driven and no measurements are made to determine whether or not it is satisfactory. If ground rods are checked and either a longer rod is used or several are driven and bonded together when necessary, this method proves satisfactory in practically every case.

BLAW-KNOX TOWERS
...a worthwhile investment*

After thorough consideration of alternate methods, The Peoples Telephone Corporation, Butler, Pennsylvania, found a Microwave Carrier System the best solution to handling the increasing number of calls between Butler and Gibsonia, Pennsylvania, a distance of 20 miles.

The 200′ Blaw-Knox tower shown here plays an important role in the complete Microwave Carrier Package which was engineered, furnished and installed by Lenkurt Electric Company and Automatic Electric Sales Corporation.

In addition to being the most economical system to install, this Microwave System also provides the company with important maintenance benefits. The "right-of-way through the sky" reduces system maintenance to a minimum, regardless of severe summer electrical storms or winter ice storms. And the sturdy Blaw-Knox hot dip galvanized steel tower has built-in provision for additional parabolic antennas as service may be extended to other areas.

Write today for Booklet 2516, which illustrates Blaw-Knox Microwave Towers and describes Blaw-Knox tower engineering, design, fabrication and erection services.

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BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PENNSYLVANIA

*Closing statement from 1955 Annual Report to stockholders: Peoples Telephone Corporation, Butler, Pa. ". . . the microwave service has proven itself to be a worthwhile investment toward our continued efforts to improve our telephone communication."

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Subscriber Line Carrier Applications

By C. M. ROBERTS

FOR MANY YEARS telephone operating companies have been faced with the rather perplexing problem of providing service to the rural areas surrounding the initial rate areas of their various exchanges in a manner that is economically attractive both to the operating company and to the prospective subscribers.

These potential subscribers are usually located some distance from each other and from the nearest telephone central office by reason of residential preference of vocation, such as farming, ranching, oil business, etc. To provide these areas with service would require construction of many miles of pole line to reach the relatively few applicants, and coarse gauging of wire in order to meet transmission and supervision limits. The resulting high investment per station would necessitate the charging of rates that usually outweigh the consumer's desire for telephone service.

Several means have been utilized to reduce the per station investment in rural areas. Primary among these has been the development of the rural party line with as many as 20 subscribers per line. Further economies have been realized by the under gauging of wire and use of long line adapters or magneto sets to increase the range of supervision, and local battery subsets to improve transmission. Capital has been conserved in some instances by the use of grounded line adapters on single wire circuits with a ground return path.

In some cases the customer pays a one-time construction charge or even builds, owns, and maintains facilities to meet existing facilities of the telephone company. There has been sufficient community interest in some localities between the rural and the urban areas so that the operating company has been able to secure adequate rates in both areas to offset the high per station investment in the rural area.

Unfortunately, none of the above schemes has resulted in a permanent solution of the rural problem. Subscribers are no longer satisfied with the grade of service offered by the rural party line. Requests for one, two, and four-party service are becoming increasingly frequent. These requests coupled with demands for semi and fully selective ringing are rapidly making the rural party line a thing of the past.

The conversion of so many exchanges to unattended dial operation has introduced numerous problems in regard to the rural plant. Extensive rehabilitation of rural lines is usually required to bring these lines within the supervision limits imposed by the use of dial rather than magneto signaling.

In instances in which the customer owns a portion of the circuit, he has often been unwilling to make the necessary improvements required for dial service, creating a rather unpleasant customer relation problem for the telephone company.

The rapid expansion of power company facilities into the rural districts, by both private and REA companies, since the war has made the use of grounded lines and phantom derived circuits impractical due to the noise problems introduced.

Unforeseen rural growth in areas where urban rates were obtained to offset the expenses of rural service has either forced the telephone company to extend service at financial loss, or placed it in the embarrassing position of refusing service, depending upon the terms of the negotiations at the time the rates were secured.

The recent trend toward the decentralization of industries has created a demand for foreign exchange service and one-party business service in sparsely settled areas.

Manufacturers of telephone equipment have recently developed and marketed three devices that should greatly aid the operating companies in meeting the above problems economically —the radio link, the line concentrator unit, and the subscriber line carrier. It is not the purpose of this paper to discuss either the radio link or the line concentrator unit.

However, in passing, it might be mentioned that a line concentrator unit would be useful in serving a small isolated community, and that the trunk lines for such a unit might possibly be provided by subscriber line carrier circuits superimposed on the physical control pairs.

From use in the toll plant, it is known that carrier systems can be used to derive a large number of circuits with a relatively small investment in the physical plant. This has been done economically because carrier systems are usually less expensive than toll grade wire circuits, and because of their flexibility.

Due to the ease of installation and removal of carrier terminals and their high salvage value, it is practical to

*Mr. Roberts is an engineer for the General Telephone Co. of the Southwest of San Angelo, Tex. He presented this address at the Plant Conference of the recent convention of the Texas Telephone Association.

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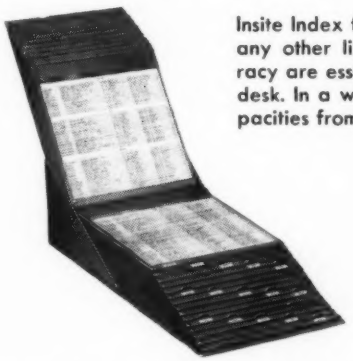

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KIND OF RECORD

Company..... Attention.....

Address.....

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Here are two informative booklets illustrating and describing various units which have been designed for, and use-tested by, telephone companies throughout the country.

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rearrange carrier derived circuits to meet varying traffic and grade of service requirements.

Subscriber line carriers possess the flexibility of their forerunner—the toll carrier. However, the distances and revenues involved in rural service are considerably less than those in toll service. It follows, then, that for subscriber line carriers to be economically practical, they must be less expensive than toll grade carriers.

This is possible as rural service requirements are less stringent, allowing the use of simpler circuits, little or no regulation, less critical filters, and, in some cases, double sideband carrier transmission or frequency modulation. In this manner, the cost of a channel of subscriber line carrier has been reduced to one third to one half of the cost of a channel of toll carrier.

In addition to economy and flexibility, use of carrier derived circuits also offers the possibility of a reduction in the number of pairs required in the entrance cable which would normally be local exchange cable.

The cable pairs thus relieved could be used to provide additional revenue by being placed in service within the initial rate area. Reduction in the number of open wire circuits required by the utilization of carrier derived circuits would further enhance the possibility of joint construction with other utility companies.

There are quite a few situations in which the use of subscriber line carriers should be considered. First of all, there is the extension of new facilities into an area not previously served.

In this case, use of carrier-derived circuits could possibly reduce the height of the base pole line and the size and number of crossarms as well as the amount of wire that would normally be required to provide the same service with open wire alone. Pole line mileage could conceivably be reduced by joint construction in instances where the use of physical circuits only would not normally permit joint pole usage.

Additions and extensions in areas already served due to requests for service or for upgrading of service, can be quite expensive in the event an additional crossarm would be required, especially if the base of the pole line must be increased to allow for the additional crossarm. Carrier systems usually prove in readily in situations such as this.

Dial conversions often require rebuilds in order to meet transmission and supervision limits. For example, a rural line composed of one-half mile of 24-gauge cable and 31 miles of 109 iron wire would have a loop resistance

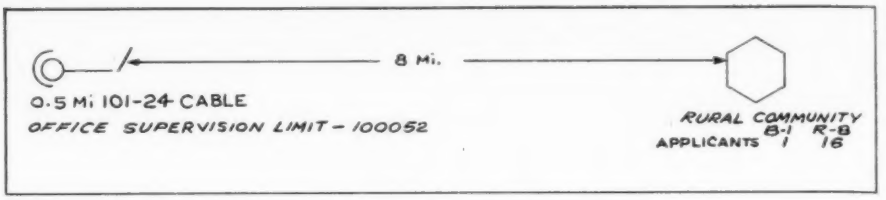


Fig. 1

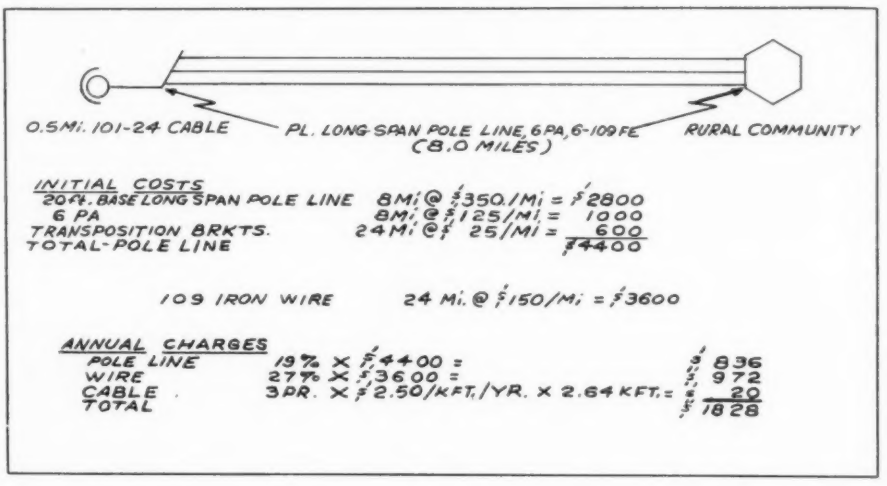

0.5 Mi. 101-24 CABLE
PL. LONG SPAN POLE LINE, 6 PA, 6-109 Fe.
(8.0 MILES)
RURAL COMMUNITY
INITIAL COSTS
20 Ft. BASE LONG SPAN POLE LINE 8 Mi @ $350/Mi = $2800
6 PA 8 Mi @ $125/Mi = 1000
TRANSPOSITION BRKTS. 24 Mi @ $25/Mi = 600
TOTAL-POLE LINE $4400
109 IRON WIRE 24 Mi. @ $150/Mi = $3600
ANNUAL CHARGES
POLE LINE 19% X $4400 = $836
WIRE 27% X $3600 = $972
CABLE 3 PR. X $2.50/KFT./YR. X 2.64 KFT. = $20
TOTAL $1828

Fig. 2

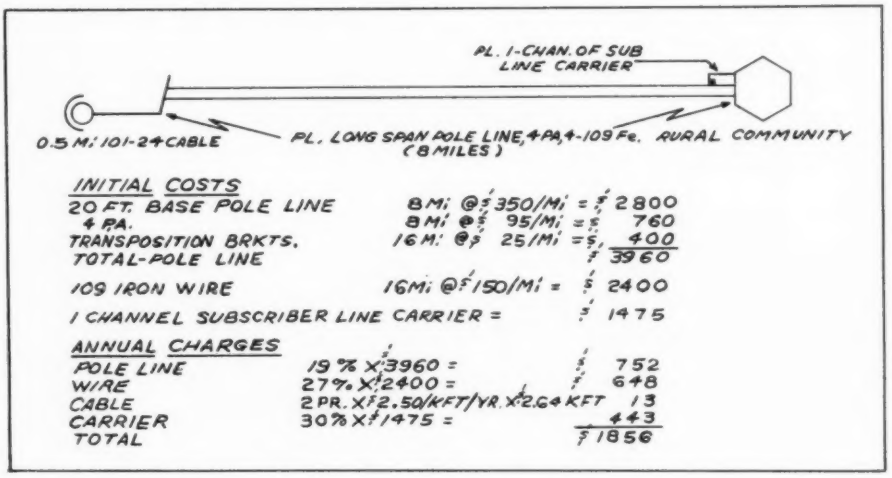

PL. 1-CHAN. OF SUB LINE CARRIER
0.5 Mi 101-24 CABLE
PL. LONG SPAN POLE LINE, 4 PA, 4-109 Fe.
(8 MILES)
RURAL COMMUNITY
INITIAL COSTS
20 FT. BASE POLE LINE 8 Mi @ $350/Mi = $2800
4 PA. 8 Mi @ $95/Mi = $760
TRANSPOSITION BRKTS. 16 Mi @ $25/Mi = $400
TOTAL-POLE LINE $3960
109 IRON WIRE 16 Mi @ $150/Mi = $2400
1 CHANNEL SUBSCRIBER LINE CARRIER = $1475
ANNUAL CHARGES
POLE LINE 19% X $3960 = $752
WIRE 27% X $2400 = $648
CABLE 2 PR. X $2.50/KFT/YR. X 2.64 KFT $13
CARRIER 30% X $1475 = $443
TOTAL $1856

Fig. 3

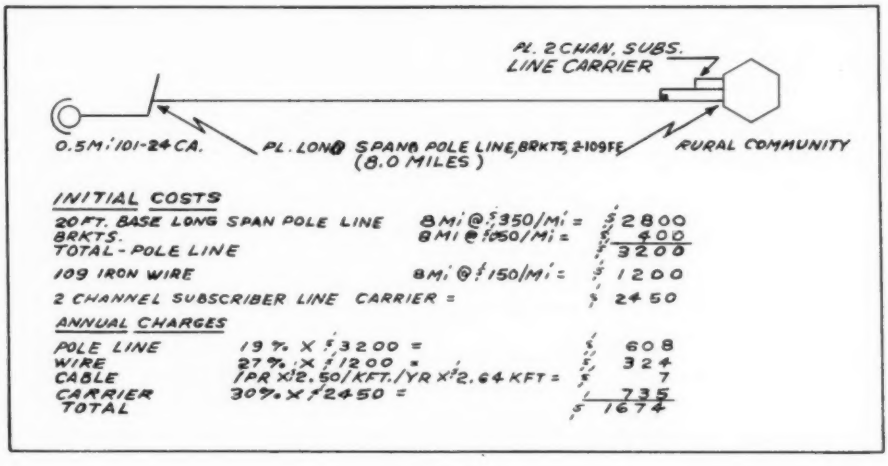
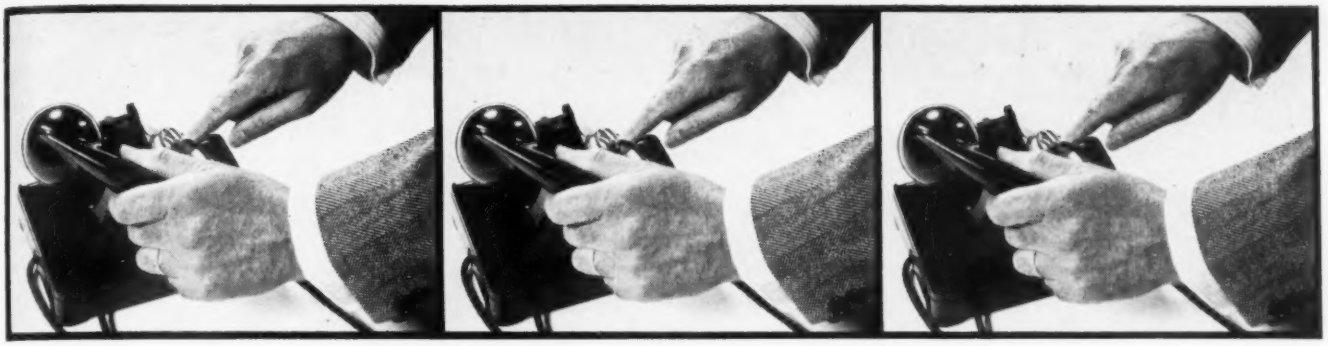
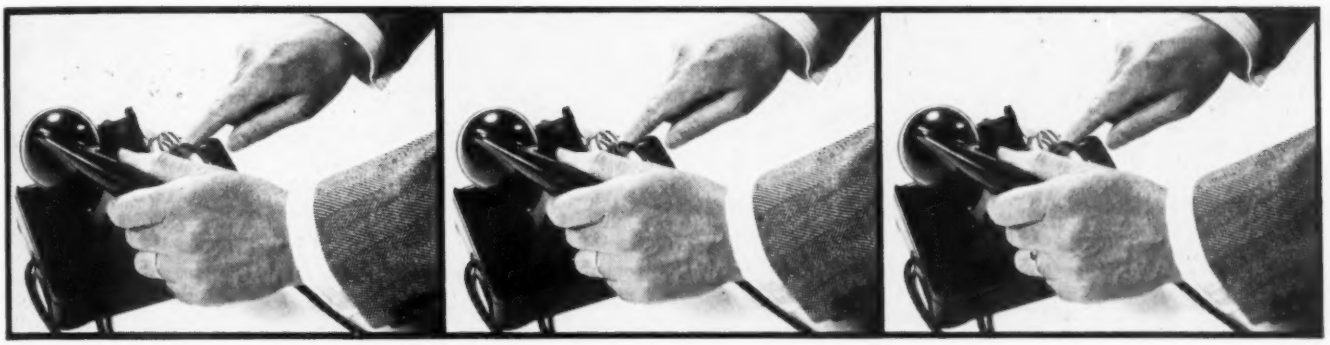

PL. 2 CHAN. SUBS. LINE CARRIER
0.5 Mi 101-24 CA.
PL. LONG SPAN POLE LINE, BRKTS, 2-109 Fe
(8.0 MILES)
RURAL COMMUNITY
INITIAL COSTS
20 FT. BASE LONG SPAN POLE LINE 8 Mi @ $350/Mi = $2800
BRKTS. 8 Mi @ $50/Mi = $400
TOTAL-POLE LINE $3200
109 IRON WIRE 8 Mi @ $150/Mi = $1200
2 CHANNEL SUBSCRIBER LINE CARRIER = $2450
ANNUAL CHARGES
POLE LINE 19% X $3200 = $608
WIRE 27% X $1200 = $324
CABLE 1 PR X 2.50/KFT./YR X 2.64 KFT = $7
CARRIER 30% X $2450 = $735
TOTAL $1674

Fig. 4



Not NINE calls—



ONE does it!

Picture the Independent Telephone Industry without the telephone supply distributors: You are planning additional plant. Without the Distributors you would have to contact each manufacturer for each kind of item required. You would have to check data, prices, delivery, with each manufacturer . . . Now, what does the Distributor do for you? One call brings you information on the various lines he carries. You get his recommendations on new products. You call him for on-the-spot service in emergencies, to rush a vital replacement. Yes, one call to the Distributor brings you information about many lines, speeds deliveries from many manufacturers, gets fast service on many problems. How much effort, time, and money does he save for you?

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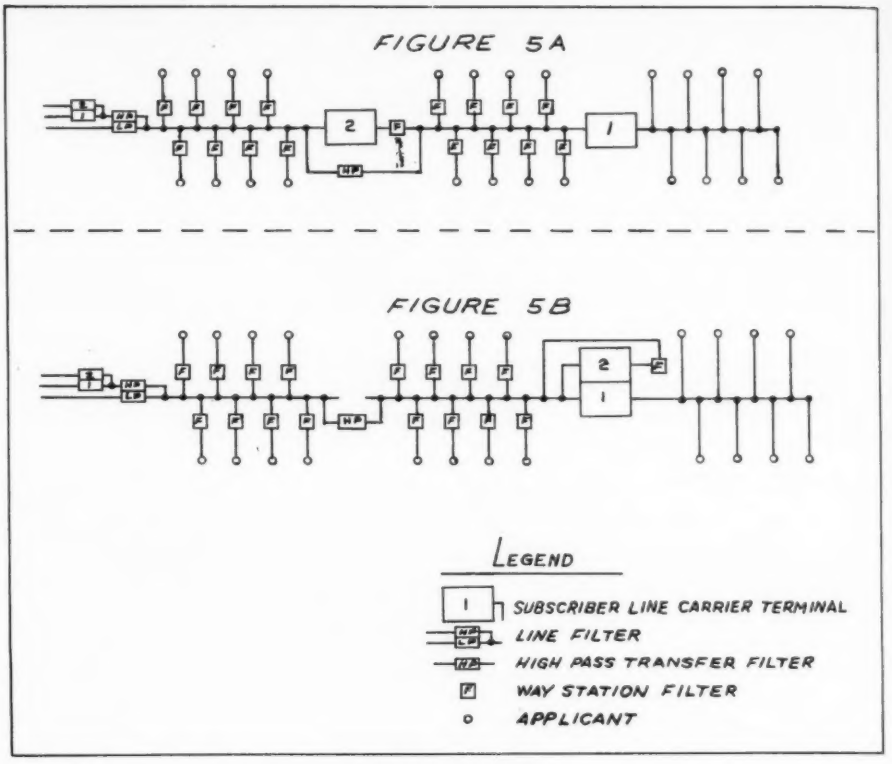
of 2,167 ohms. Even if the line were equipped with a long line adapter, extending the supervision limit to approximately 1,800 ohms, it would still exceed the supervision limit.

The remote terminal of a subscriber line carrier operating at 20 kilocycles with a gain of 35 db could be placed 16 miles from the cable terminal. The remaining 15 miles of 109 iron wire would have a loop resistance of 982 ohms. Since the subscriber terminals usually have a supervision limit of at least 1,000 ohms, signaling requirements would be met.

Quite a few factors are to be considered in determining whether certain required facilities are to be provided by means of subscriber line carrier circuits or by open wire circuits. This is primarily an economic study of the plant that would be required in each instance. A useful tool in this study is the posting of the geographic location of existing facilities, subscribers, applicants, and the various classes of prospects on a map of the area, or a line schematic drawing laid out geographically and to scale.

(Please turn to page 75)



Figs. 5A and 5B

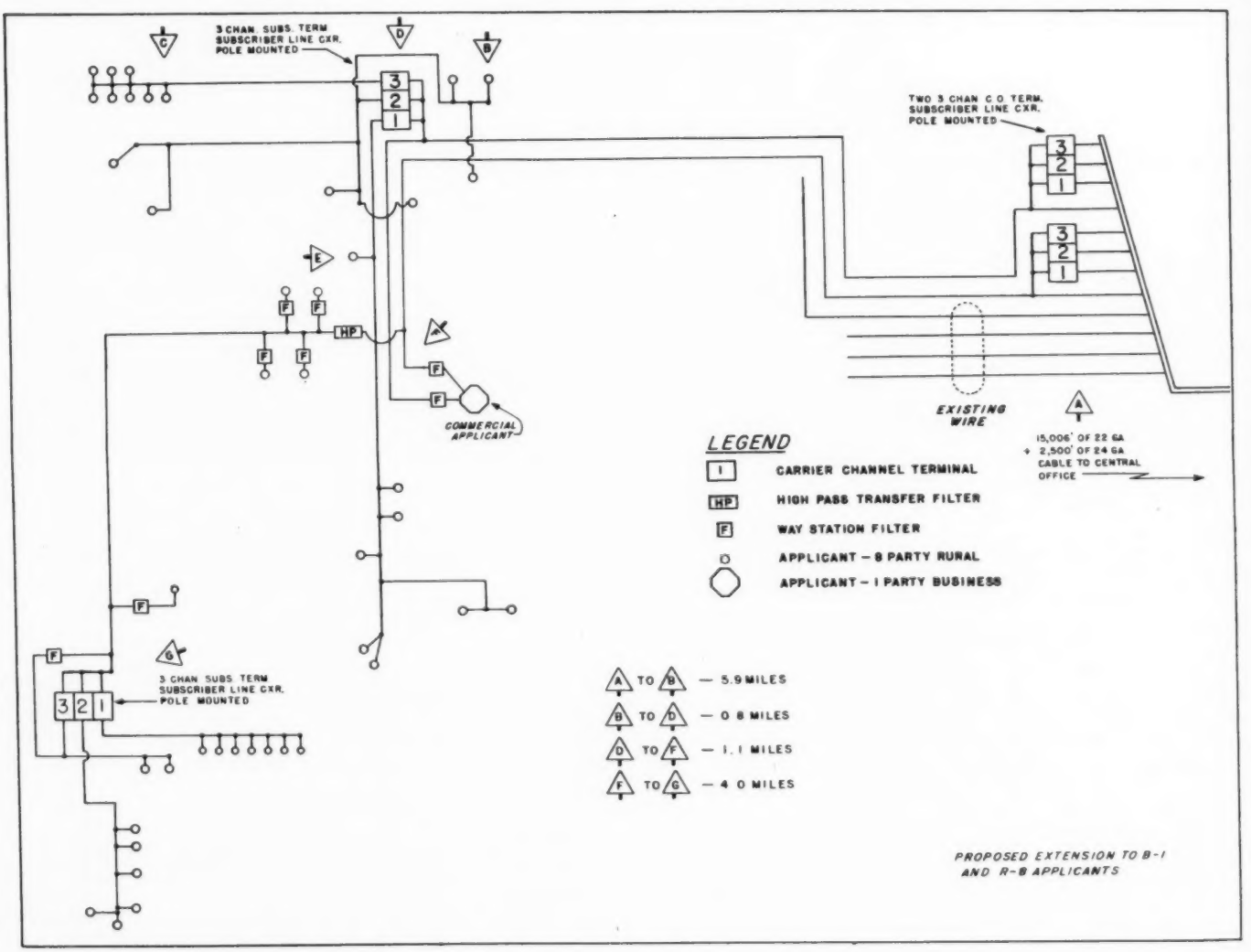

3 CHAN. SUBS. TERM. SUBSCRIBER LINE CXR. POLE MOUNTED
TWO 3 CHAN C.O. TERM. SUBSCRIBER LINE CXR. POLE MOUNTED
EXISTING WIRE
15,000' OF 22 GA + 2,500' OF 24 GA CABLE TO CENTRAL OFFICE
COMMERCIAL APPLICANT
3 CHAN. SUBS. TERM. SUBSCRIBER LINE CXR. POLE MOUNTED
LEGEND
CARRIER CHANNEL TERMINAL
HIGH PASS TRANSFER FILTER
WAY STATION FILTER
APPLICANT – 8 PARTY RURAL
APPLICANT – 1 PARTY BUSINESS
A TO B – 5.9 MILES
B TO D – 0.8 MILES
D TO F – 1.1 MILES
F TO G – 4.0 MILES
PROPOSED EXTENSION TO B-1 AND R-8 APPLICANTS

Fig. 6

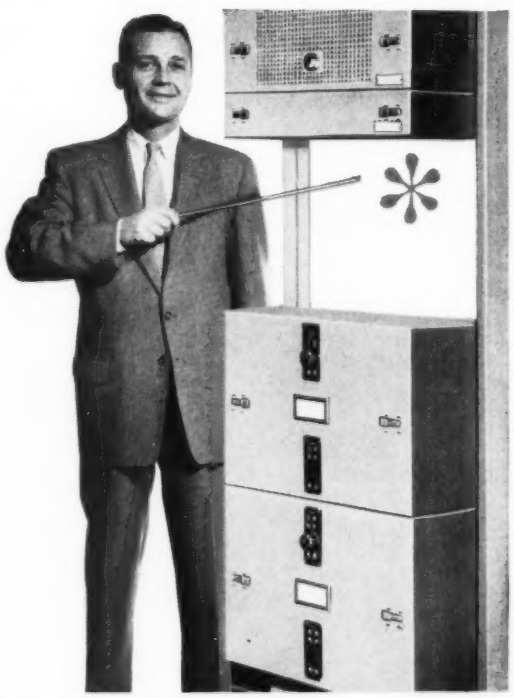
You and your carrier can grow together

Even if you are "starting small"—even if you've had little (or no) experience with carrier—you'll find Lenkurt Type 33A Carrier is made for you.

It is a low-cost, easy-to-use system that really fits your budget. And it is easy to install, easy to maintain, easy to expand. (You can start with a single channel, add a second, then a third.) There are no more lines to string, no construction man-hours wasted. It is by far the least expensive, least complicated way to add new channels; in fact Lenkurt Type 33A often proves-in over distances as short as 7 miles!

Learn how this Lenkurt Carrier system can help you solve *your* communication problems. *Write today* for Bulletin 33A-P20. Or contact Automatic Electric carrier engineers for their specific recommendations. *Address* Automatic Electric Sales Corporation, 1033 West Van Buren Street (HAymarket 1-4300), Chicago 7, Illinois. *In Canada:* Automatic Electric Sales (Canada) Ltd., Toronto. *Offices in principal cities.*

✳ this space reserved for expansion



LENKURT TYPE 33A CARRIER *gives you new telephone channels with* ● *no new poles* ● *no new lines* ● *no added construction crew — just this simple, compact unit.*

● *EASY to install — Carrier can be in operation in less than a week after equipment arrives.*

● *EASY to maintain — Your own men can service it with simple, low-cost equipment.*

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Originators of the dial telephone · Pioneers in automatic control

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Glossary of Telephone Abbreviations

Realizing the need for the use of abbreviations in various phases of telephone operating work, the editor of *Telephony* commissioned the author to prepare a list of abbreviations currently being used by larger telephone operating companies, for the benefit of companies which may not have established a set of such abbreviations.

Examinations of the various abbreviations used by some of the larger companies, to save time and space in the formulation of reports and records, including Bell System companies, were made and the following list has been compiled for the benefit of those companies which desire to consider the adoption or expansion of a system of abbreviations.

Abbreviations presented here consist of parts of a word, as a substitute for the whole word, and are arranged alphabetically. In such a glossary, it would be difficult to include all known abbreviations pertaining to the telephone business. Therefore, allowance must be made for possible omissions. However, it is hoped that the glossary, as compiled, will commend itself as a practical reference.

Compiled by JOHN A. BRACKEN

A

A	Anchor.
AAB	Attachment at building.
AAP	Attachment at pole.
AB	Anyone who can talk business.
ABD	Abandoned.
ACE	Aerial cable entrance.
AC LST	Alternating call listing.
ACC	Access.
ACCT	Account.
ACO	Automatic cut-off.
ACT	Action taken.
ADDR	Address.
ADJ	Adjustment.
ADJ T	Adjustment test.
ADT	American district telegraph.
ADV	Advanced.
ADV PY	Advanced payment.
AER CA	Aerial cable.
AF	Adequate facilities.
AFDC	Apparatus for deaf customers.
AG	Try again.
AGCY	Agency.
AGT	Agent.
AJ	Answering jack.
AL	Alarm.
AL MI	Air line mileage.
ALST	Additional listing.
ALT	Alignment.
AMPF	Amplifier.
AMT	Amount.
AN	Angle.
ANC	Ancillary
AN CD	Answering cord.
ANK	Appointment not kept.
ANS	Answer.
AO	Assistance operator.
APH	Apartment house.
AP LI	Apparatus left in.
APP	Accident prevention program.
APPT	Appointment.
APT	Apartment.
ARAS	All-relay automatic system.
ARP	Air raid protection.
ARR	Arrester.
ART L	Artificial line.
AS	Audible signal.
ASA	American still alarm.
ASC	Assignment clerk.
ASG	Automatic signaling.
AS SH	Assignment sheet.
AT	Armature travel.
ATB	All trunks busy.
ATC	Additional talking circuit.
ATL	Automatic tie line.
ATR	Assigned to repairman.
ATS	Anti-sidetone.
ATT	Attended public telephone.
AUH	Automatic holding.
AULO	Automatic lock-out equipment.
AUO	Automatic operation.
AUS	Automatic signaling.
AUSW	Automatic switching.
AUT	Automatic trunk.
AUX	Auxiliary.
AUX R	Auxiliary receiver.
AUXS	Auxiliary signal.
AV	Avenue.
AVG	Average.
AVG AT	Average answering time.
AVG CT	Average connecting time.
AVG DT	Average disconnect time.
AVG RT	Average ringing time.
AW	Aerial wire.
AWG	American wire gauge.
AXA	Alley cross arm.
AY	Any one.

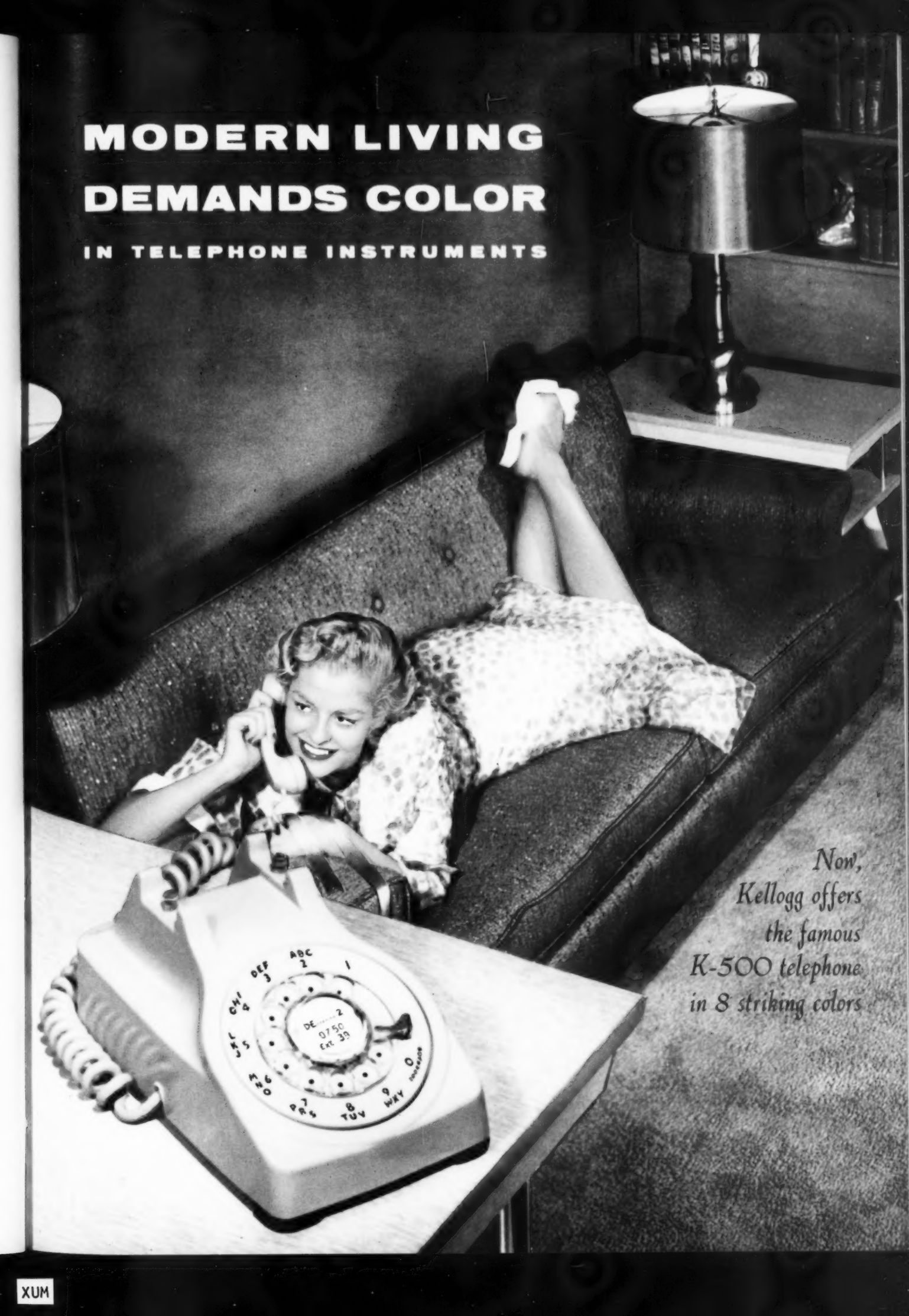
B

B	Bell.
BAT	Battery.
BASM	Basement.
BB	Bunch block.
B BAT	Building battery.
BBEW	Braided black enamel wire.
BBM	Break before make.
B BX	Bell box.
BCL	Bridging connection loose.
BCOK	Battery cut off key.
BCOR	Bridge cut off relay.
BCO RLS	Bridge cut off release.
BDR	Bell doesn't ring.
BDRT	Bell doesn't ring at times.
BDT	Breakdown test.
BF	Battery feed.
BHS	Business hotel service.
BI	Broken insulator.
BKR	Bells keep ringing.
BKW	Block wire.
BL	Blue.
BLDG	Building.
BL BR	Blue-brown.
BL GN	Blue-green.
BLK	Black.
BL OR	Blue-orange.

(Please turn to page 38)

Order Reprints Now!

Reprints of the completed "Glossary of Telephone Abbreviations" will be available following its publication in TELEPHONY, *provided sufficient orders are received to justify reprinting.* Companies desiring reprints for their employes are asked to inform TELEPHONY the quantity they will need as early as possible.


MODERN LIVING
DEMANDS COLOR
IN TELEPHONE INSTRUMENTS
Now,
Kellogg offers
the famous
K-500 telephone
in 8 striking colors

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Conveniently located color telephones add a distinctive note to the decor of any room.

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THE DEMAND FOR COLOR MEANS MORE REVENUE FOR YOU

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In 8 colors in combination with black. The parts that are handled are in practical black while the body of the telephone is in brilliant color. It is easy to convert the standard K-500 into a two-tone telephone . . . simply remove the black housing and slip on a new color housing.

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Bedroom telephone . . . convenient and comforting to have near-by at night . . . now color adds that extra touch.

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Kitchen telephone . . . a real convenience to the busy homemaker . . . in glamourous colors.

Laundry-recreation room telephone . . . saves running up the stairs . . . and a perfect spot for a bright color accent.

Business offices . . . The color telephone is becoming a "must" for modern business offices. Greys and browns match office fixtures . . . bright contrasting colors are popular too.

Boost Revenue—Sell the charm of color—along with the convenience of that extra telephone.

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Raspberry Red

Wedgewood Green

Charcoal Grey

Maize Yellow

Sable Brown

Desert Sand

Mediterranean Blue

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ORDER NOW

Demand is heavy for these distinctive colorful phones, so order now to be sure of prompt delivery.

KELLOGG
A DIVISION OF IT&T

Telephone by Automatic Electric

Who needs 8½ million telephones?

Last year, the number grew by almost half a million—to serve even better the 11,000 communities, major cities, suburbs and fertile farmlands of two-thirds of the nation. For these are the telephones of America's Independent telephone companies. Increasing at the rate of one new telephone every 66 seconds!

Meeting *your* need for the dependable, low-cost communication so essential to our nation's growth.

Independent Telephone Companies of America

United States Independent Telephone Association • Pennsylvania Building • Washington, D.C.

This 26th USITA national ad appeared in Apr. 30 *Time* and May 4 *U.S. News and World Report.*

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BL SL	Blue-slate.
BLT	Ballistic test.
BM	Booth moved.
BNR	Messenger not returned.
BNW	Balancing network.
BO	Business office.
BON	Building out network.
BP	Binding post.
BPW	Both parties working.
BPL	Broken pole.
BR	Brown.
BRA	Base rate area.
BR S	Brown-slate.
BRG	Bridge.
BRG CON	Bridging connection.
BRF	Bell rings faintly.
BRNL	Bell rings no one on line.
BRTL	Bell rings too loud.
BRWD	Bell rings while dialing.
BR WH	Brown-white.
BS	Battery signal.
BSI	Battery supply information.
BT	Battery trouble.
BTAL	Busy test on all lines.
BTH	Booth.
BTH ODU	Booth, outdoor use.
BURCA	Buried cable.
BUS	Business.
BUT	Bring up to date.
BUW	Buried wire.
BVD	Boulevard.
BW	Block wire.
BWG	Birmingham wire gauge.
BXA	Broken cross arm.
BY	Busy.
BYB	Busy back.
BYL	Busy lamp.
BYNT	Busy, not talking.
BYS	Busy signal.

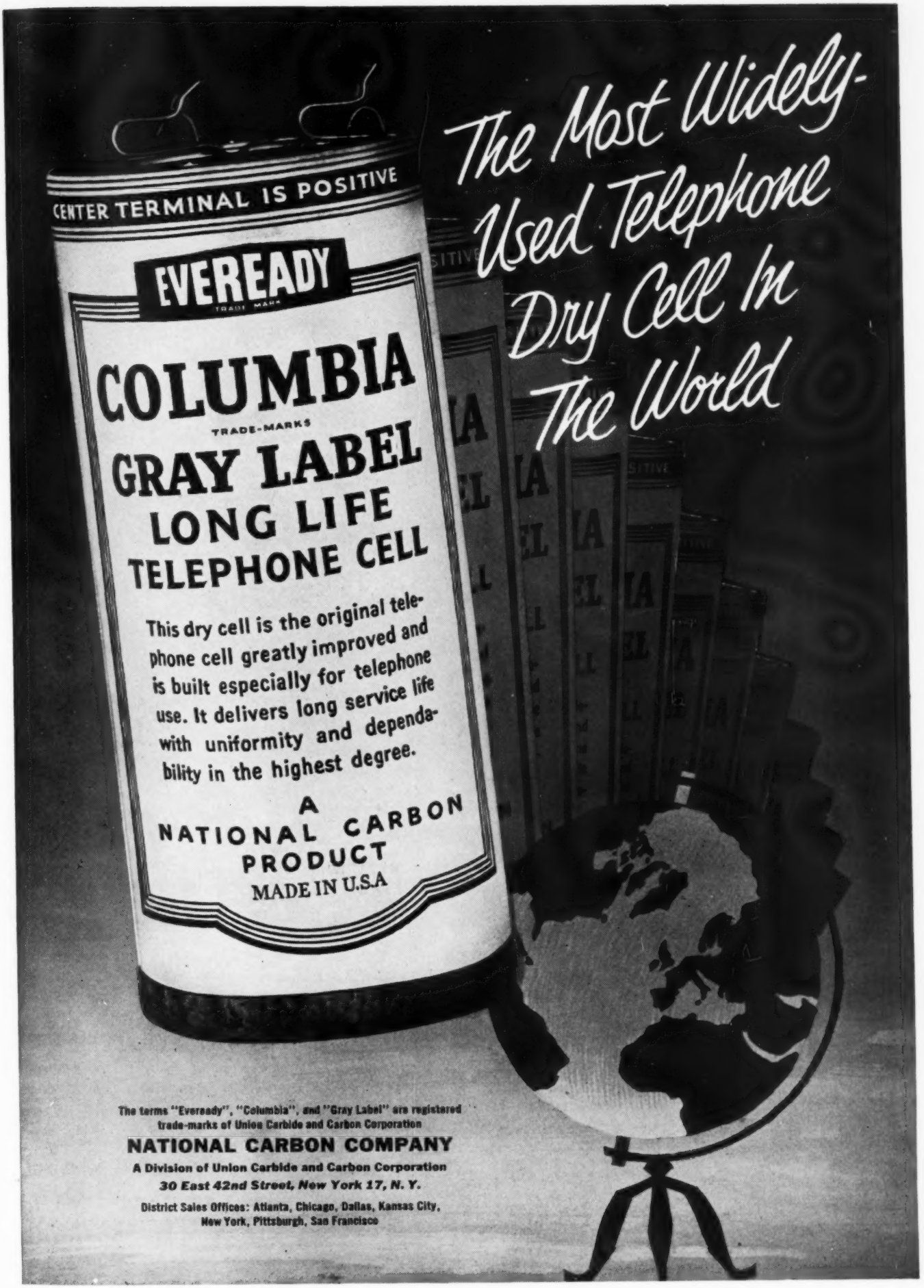
C

CANC	Cancellation.
CAB	Clearance above ground.
CABT	Cabinet.
CAL ADJ	Calibration adjustment.
CAP	Capacitance.
CA PR	Cable pair.
CAR	Cable removed.
CAX	Community automatic exchange.
CB	Coin box.
CBA	Coin box alarm.
CBC	Can't be called.
CBD	Control board.
CBDT	Can't break dial tone.
CBH	Can't be heard.
CBK	Connecting block.
CBL	Cable.
CBM	Combination man.
CC	Collect call.
CCL	Can't collect.
CCO	Can't call out.
CCR	Cable carrier repeater.
CCS	Code calling system.
CCSS	Combined code and selective signaling.
CCSW	Copper covered steel wire.
CCT	Circuit.
CD	Circuit description.
CDC	Can't deposit coin.
CDF	Combination distributing frame.
CDR	Coin doesn't return.
CEC	Common equipment charge.
CF	Cannot find.
CFA	Current flow adjustment.
CFB	Clearance from building.
CFLT	Cable fault locating test.
CFR	Cable fill report.
CFT	Current flow test.
CFTM	Carrier frequency transmission measurement.
CFWN	Called for wrong number.
CG PBX	Can't get private branch exchange.
CH	Can't hear.
CHCT	Can hear but can't talk.
CHF OPR	Chief operator.
CHG	Charge.
CHN	Change.
CHR	Cable history record.
CHTL	Can't hear on trunk line.
CI	Call indicator.
CIT	Call indicator trunk.
CJ	Connecting jack.
CLC	Customer's line card.
CLG	Calling.
CL HD	Classified heading.
CLK	Clerk.
CLPH	Calling party hold.
CLR	Combined line and recording.
CLS	Class of service.
CLSB	Cordless switchboard.
CLSL	Combined line and supervisory lamp.
CLSS	Combined line and supervisory signal.
CLT	Coin line trouble.
CN	Cable number.
CNC	Control circuit.
CNH	Customer not home.
CO	Central office.
CO DLY	Company delay.
CO EQ	Central office equipment.
COP	Central office protector.
CO RLS	Cut-off release.
CO TER	Central office termination.
COA CA	Coaxial cable.
COD	Clearing out drop.
COF	Cause of fault.
COK	Cut-out key.
COM	Count of multiple.
COM EQ	Common equipment.
COML	Commercial.
COMP CA	Composite cable.
COM RG	Composite ringer.
CON	Connector.
CON RLS	Connector release.
CONF SER	Conference service.
CONN	Connection.
CONST	Construction.
CONT EQ	Control equipment.
COR	Corner.
COR ORD	Corrected order.
CORP	Central office repairman.
CORS	Central office ringing supply.
COS	Completed order summary.
COSW	Cut-out switch.
COT	Carried over trouble.
CPC	Cable pair change.
CPCH	Called party can't hear.
CPGB	Calling party gets bang in ear.
CPH	Called party hold.
CPO	Capacitor open.
CPR	Calling party release.
CPS	Capacitor short.
CR	Customer's report.
CRC	Cannot return coin.
CRPC	Carrier repeater circuit.
CRS	Cradle switch.
CRWD	Coin return while dialing.
CS	Cut sheet.
CSB	Connector switch bank.
CSBK	Cable sheath break.
CSI	Complete station installation.
CSL	Call selector.
CSP	Contact spring.
CT	Court.
CTB	Cable testing bureau.
CTCL	Cable terminal classification.
CTC	Cable terminal court.
CTLC	Combination toll and local connector.
CTN	Cable terminal number.
CTO	Cut off.
CTP	Cable terminal pole.
CTR	Cable trouble report.
CTS O	Cuts out.
CTT	Cable trouble ticket.
CTR	Customer's trouble report.
CV	Cable vault.
CW	Call wire.
CWFW	Contact with foreign wire.

D

D	Directory work required or designating an intermediate dialing center.
DA	Doesn't answer.
DAF	Delayed awaiting facilities.
DB	Decibel.
DBC	Double connection.
DBT	Drop bracket transportation.
DC	Duplicate copy.
DCK	Dial control key.
DDD	Direct distance dialing (customer toll dialing).
DE	Dead-end.
DES	Designation.
DEF	Defective.
DEPT	Department.
DFC	Deaf customer.
DFW	Damaged by foreign workmen.
DFWS	Dial finger wheel stuck.
DGC	Doesn't get calls.
DH R	Double head receiver.

(Please turn to page 80)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XUM

Merchandising

Means

MOVING

Merchandise

*By Henry C. Dennis**

THIS article is designed to stimulate telephone people into thinking of new and novel telephone sales ideas and approaches.

Sears, Roebuck & Co. learned that taking merchandise out of closed-in showcases and placing it on open counters where prospective customers could handle items made selling easier. In line with this, the writer challenges telephone salespeople to take steps in the same direction.

Recently a stock brokerage firm opened an office in a giant Pennsylvania shopping center and is planning further extensions of this idea. Why couldn't telephone companies tie-in with some chain stores—not only by displaying telephones in their stores periodically, but also sharing their weekend advertisements in newspapers and the stores' front windows, as well as in displays within the store proper. Think of it:

Spring Season Specials of Telephones
Ideal Graduation Gift:
Separate Telephone Line and
Directory Listing
Keep Cool & Comfortable—
Install an Extension Telephone
Decorating Hint:
Match Color of Telephone with Room

Have we not all heard complaints of the veritable lack of satisfactory domestic help these postwar days? Who is there who hasn't had a message garbled by a disinterested baby sitter? Could it be that the busy housewife might find an ideal secretary in an automatic answering and recording device? Have we set a sales target for the domestic scene, or have we thought of this telephone device only in terms of business?

Again, what about farmers and ranchers — sometimes they're out attending to chores or customers — or otherwise out of hearing of the telephone. These people are ideal prospects, of course, for gongs and bells, but by the time they hustle inside they might find the caller has hung up.

Extension in order, you say? Probably getting hotter and might be quite handy. However, why not an automatic answering and recording device?

Again, if they are doing chores or tractoring or are away from the base entirely, they'd be free from worry about possible lost sales due to no one being available to take telephone calls and orders.

Pharmacists should be good prospects for unlisted telephone numbers. One pharmacist we know has an unlisted telephone number for doctors who call in prescriptions—thus freeing the listed telephone for customers.

Who hasn't been in a bath or shower when a telephone rang? Not a very comfortable feeling to dash out dripping wet, in a frenzy to attempt to answer! Don't answer, you say? Well, by George, I'll bet it creeps into the subconcious and annoys you not to know who called and whether or not it was urgent. Here the sales feature advanced is the loudspeaker telephone located in the bathroom where you can talk as you safely and comfortably towel off the water or leisurely dunk in the tub after briefly interrupting to lift up the telephone and push key.

The preceding paragraph gives us clues for the housewife who dashes to the telephone and pants madly: "Hello, I can't speak to you now, I'm doing———to the baby," etc. Perhaps, her situation might be mixing a cake, making gravy, hanging laundry, etc., but the usefulness of a loudspeaker telephone sells itself to a woman constantly faced in her work with the telephone jingling at the wrong time.

What parent is there who hasn't been embarrassed with the arrival of a telephone repairman who politely informs them that their telephone is off the hook . . . and they find Junior has been at it again? The answer naturally is a wall set.

As a matter of fact, I know one family who didn't find out why they were constantly hearing the growler announce that their handset was off the cradle again, until one day they found the answer—their cat!

Perhaps, in your area it might be a dog or a cow or a horse upsetting a telephone carelessly set on a ledge or a desk in the barn.

One could go on and on listing situations, which, when properly advertised, might rouse customers into thinking of their own particular situations thereby resulting in unparalleled demand for telephone merchandise.

Let's not disregard the impulse buyer—many a presumed "leak-proof" budget has given way when a spouse gives vent to an impulse—any reason the telephone companies have to pass up a cut of this market?

A leading industrial designer, J. O. Reinecke, has succinctly pointed out that colors nab the purchasers' eye. The president of the Grocery Manufacturers of America, Inc., Paul Willis, was quoted as having said: "The ideal package should have the 'come hither, pick-me-up, and take-me-home look.'" Who are we to differ when faced with the increase of sales of colored telephones around the Yule season . . . but why not have them on display on weekends in busy shopping centers?

The my-friend-has-one pressure is a psychological situation which many people find difficult to resist. For instance, as soon as a neighbor has a new telephone item, you can be sure the followers will want to emulate her and strive not to be outdone, or in some other way to regain the social initiative.

Equally true is the fact that it won't be long before even the less well-to-do will be in the business office clamoring to be sold. You just can't resist the appeal to the ego, the comfortable mode of living, exemplified by certain of the recent telephone advances.

Go to it. Let's use sound sales tricks in '56!

*Mr. Dennis is a research economist and commercial development engineer with Mountain States Telephone & Telegraph Co. at Albuquerque, N. M.

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XUM

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

WHEN A TELEPHONE receiver is left off the hook, "Central" is usually in trouble. She must first determine if there is trouble on the line, mechanical, or otherwise, and take whatever action is necessary.

Probably ever since the telephone has been invented, little children have found it to be a fascinating gadget. They like to use it, play with it, or toss it around. If the youngster is uncooperative, Central is in for some real trouble. She must use every bit of ingenuity and patience she possesses to induce the youngster to hang up the receiver.

A receiver off the hook may be an indication of someone in distress, particularly if any unusual sounds are heard, such as a whimper or moan.

According to Miss Frances Dawson, chief operator in Illinois Bell's Irving office, there is one time she will never forget. "We had a signal on the monitor position showing that a telephone was off the hook, and when we plugged in all we could hear was a weak sort of whimpering. It sounded like a child, perhaps badly injured.

We quickly had the line traced and learned that the telephone was in a butcher shop. It was night time. We located the owner, called him, and told him he'd better get to his shop right away because a child was in it, crying.

"He hurried over and in due time his voice came over the telephone with the following report: 'It's just a puppy. He got locked in the store and knocked over the telephone trying to get into the meat counter.'"

This was not so serious, but think what it might have been if a child had been involved! It would have been a terrifying experience, one that a child would remember for a long time to come.

According to Miss Dawson, "The most common response we get in checking up on a telephone left off the hook is "Oh, excuse me. I was just dusting."

"Once," she stated, "we were told a woman said she was scrubbing her telephone with soap and water. She was urged to desist immediately." How clean can you get!

Mrs. Winifred Cain, mother of two small boys, is considered an expert in handling children who take the telephone receiver off the hook. "When I find a child on the other end of the line," she said, "I first ask it to get its mommy. This isn't likely to work, although it's worth a try. The usual response is 'She's not here,' or 'She's busy,' or 'I'm all alone.'" Mrs. Cain then tries the direct approach: "Now be a good pal and put the telephone back where it lives." If the child comes back with "How old are you?" Mrs. Cain knows she must resort to the "wearing-down" technique. She tries to work the conversation around to a point where the child either gets its mommy or puts the receiver back on the hook.

Naturally, Telephone company regulations governing conversations with subscribers are relaxed in such emergencies. According to Miss Dawson she has even overheard operators saying, "Let's hear you be a cute little fellow, honey, and call for your mommy. One..two..three..here we go, now, MOMMY!"

Telephone operators throughout the nation are familiar with these problems, for youngsters are the same the world over.

There are times, however, when a telephone receiver is left off the hook in cases of emergency and it behooves each operator to take these conditions seriously unless she determines no emergency exists. It is true, in some instances it may turn out to be a "False Alarm." But there is too much involved to take a chance—a life perhaps.

The writer remembers an instance in her telephone experience when a receiver was off the hook and a moaning sound was heard. The police were summoned and a man in an office directly across from the telephone exchange had been robbed and beaten by robbers. He just had enough strength left to knock the receiver off the hook. He had bled profusely and a little delay in summoning help in this instance would probably have proved fatal to the man who had been assaulted. In his way of thinking, the operator who summoned aid had saved his life and he was most grateful.

A "False Alarm" may prove embarrassing, but it is better to suffer from embarrassment than to take a chance. The operator's alertness will be appreciated even though an emergency may not exist. Her customer will know that she is on the job and looking after his welfare.

Traffic Questions

(1) What is the purpose of Aircraft Flash service?

(2) How is Aircraft Flash service accomplished?

(3) How is the area covered by a Filter Center subdivided?

(4) How does the observation post observer place a call when calling a Filter Center?

(5) If an "Aircraft Flash" call is given to a local operator, how will she proceed?

Answers are presented on page 79.

New Tools to Bring Change

"Looking into the future we see a period of change in which business will drastically revamp its methods to effectively use the electronic tools which are now available." — EUGENE M. GRABBE, *computer systems division, Ramo-Wooldridge Corp.*

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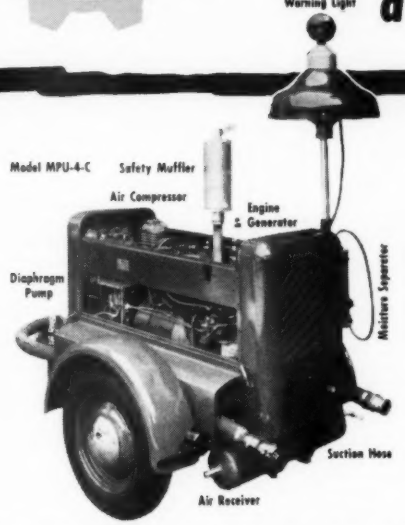

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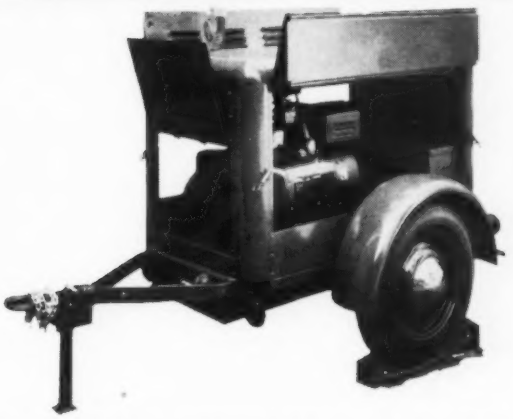
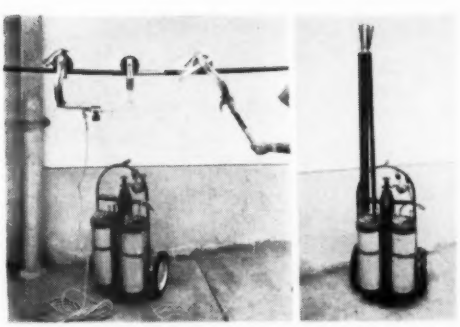
• Air Compressor—to put cables under pressure for cutovers or repairs. *Furnished with or without pump and compressor.* This unit is extremely versatile and very dependable. It has a 300-Watt floodlight, push button control, buzzer signal, supplies dry air, operates electric blower, soldering pot and iron, electric and air tools—is light, easy to handle.



MAINTENANCE GENERATOR (Model T-300)

Used for maintenance or standby service. Equipment includes tool box, fuel tank, safety chain & chocks, tail light & reflectors and sheet metal house with hinged sides, hinged front cover. Trailer is available with or without generator. Approximate size: 92″ long, 53″ wide, 51″ high. With the generator, approximate weight is 800 pounds.



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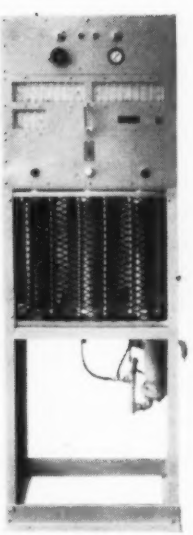

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Section 9 (continued)

All cordless switchboards are provided with through supervision and there is no practical way of modifying them for non-through supervision.

On all cord switchboards, whether wired for non-through supervision or not, give through supervision on a central office trunk when the night or through-dial key is thrown. On PBX switchboards arranged for through supervision, the operation of the attendant's talking key removes the through supervision feature, providing the night or through-dialing key is not operated at the same time.

Through supervision generally proves best at one-position boards where attendants are usually assigned other work in addition to operating. PBX trunks and central office equipment are released as soon as the extension user hangs up, rather than by a disconnect of the attendant.

With this arrangement, it is not possible to recall the attendant on originating dial calls, as the supervision is under the control of the extension user and the operation of the receiver switchhook at the extension telephone would cause the dial equipment to release and result in a cut-off. On calls completed by a local or toll operator, the operation of the receiver switchhook will show a flashing cord signal in both the central office and on the PBX switchboard.

At switchboards which are covered during the business day, and on which disconnects are given prompt attention, the advantages of through supervision will be less. When equipped with non-through supervision, the extension user can recall the attendant without disturbing the established connection or bringing in the central office operator. At PBX switchboards where trunk calls are subject to frequent transfers, non-through supervision is a desirable feature.

Through and non-through supervision is provided by individual cord pairs and can be changed from one to the other by a somewhat simple rearrangement of wiring.

Cord supervision is one of the most important factors in the correct operation of a PBX switchboard. With the speeding up of toll service through operator toll dialing the toll operator, in a good many cases, disconnects by cord signal. Careless handling of disconnects at a PBX could add considerable costs to a firm's long distance service.

Cut-offs exasperate a customer. Only when she has full knowledge of what is to be done when an order is received to transfer a trunk call, can an attendant avoid such annoying happenings. The Service Adviser should know each of the switchboards she supervises intimately and be able to teach the attendant how to transfer trunk calls. If she has no information as to whether a particular PBX has through or non-through supervision, she should obtain the information from the telephone company Plant Department.

Some PBX extension users make verbal requests for the attendant to transfer trunk calls. The operator's talking key must be operated in this case before the transfer is made, if a cut-off is to be avoided.

SECTION 10

Analysis of PBX Attendant's Non-Operating Duties

On cordless PBX switchboards and on some one-position boards carrying light loads, attendants perform work other than that of operating. We know, of course, that an attendant's primary duty should be one of operating her switchboard and all non-operating activities should be subordinated to her task of giving her firm's customers the kind of service they expect and should receive.

But does the customer management know that non-operating duties which interfere with the handling of traffic properly are a menace to good service and to good public relations?

An analysis of a PBX attendant's non-operating functions can be used as a basis for discussion with the customer's management if and when an attendant's miscellaneous duties are hurting the service and it becomes necessary to seek a correction of the conditions.

In making such an analysis the following items should be considered:

If there is sufficient demand the Handbook will be reprinted.

(1) The amount of traffic as determined by peg count.

(2) The number and type of attendant's other duties.

(3) The proportion of the attendant's total work time which is given to other duties.

(4) Reason of assignment of other work.

(5) Whether attendant finds it necessary to leave the switchboard to perform other work and if so, the location of files or other office equipment used.

The Service Adviser, if practicable, should obtain the necessary information by visual observation. However, such a method may have to be supplemented by questioning the attendant regarding features which are not evident during the visit.

Before any discussion with the customer's management, the Service Adviser should make an accurate estimate of the attendant's work, the time she spends on non-operating work, and the conditions under which this work is performed, and just when and how much her non-operating duties interfere with her more important job of giving satisfactory telephone service to her own organization and to her firm's customers.

If the results indicate that, along with interference of other work, the attendant needs further training, the Service Adviser should supply it. If, however, the sub-standard service is due entirely to the interference of miscellaneous tasks, and no embarrassment will result for the attendant, it should be brought to the attention of the management but only after the attendant has been told of the proposed action.

We cannot repeat too often, that it is the obligation of the telephone company to educate the PBX customer management, extension users and attendants to become telephone-wise, so they can and do get the most out of the telephone equipment they are paying for.

When other duties interfere with an attendant's work to the point that she has to delay answering calls, that delay is passed on to the extension user, to the management, and to the calling customer, and it should be so explained to the PBX subscriber. Such service is costly, both from a lost-business and a lost-public-esteem standpoint.

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Federal Telecommunication Laboratories—the center of communications research for both Kellogg and Federal.

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Federal Telephone and Radio Company of Clifton, New Jersey, an associate manufacturing company of Kellogg and one of the leading manufacturers of the International Telephone and Telegraph Corporation, has been a most important and continuous contributor to the growth of telecommunications in the United States.

Federal is one of the nation's foremost producers of dial automatic telephone switching systems and associated equipment. Today, hundreds of thousands of lines of dial switching equipment produced in the company's million-square-foot plant in Clifton, New Jersey, are providing modern and efficient communication in leading cities and growing communities of the nation.

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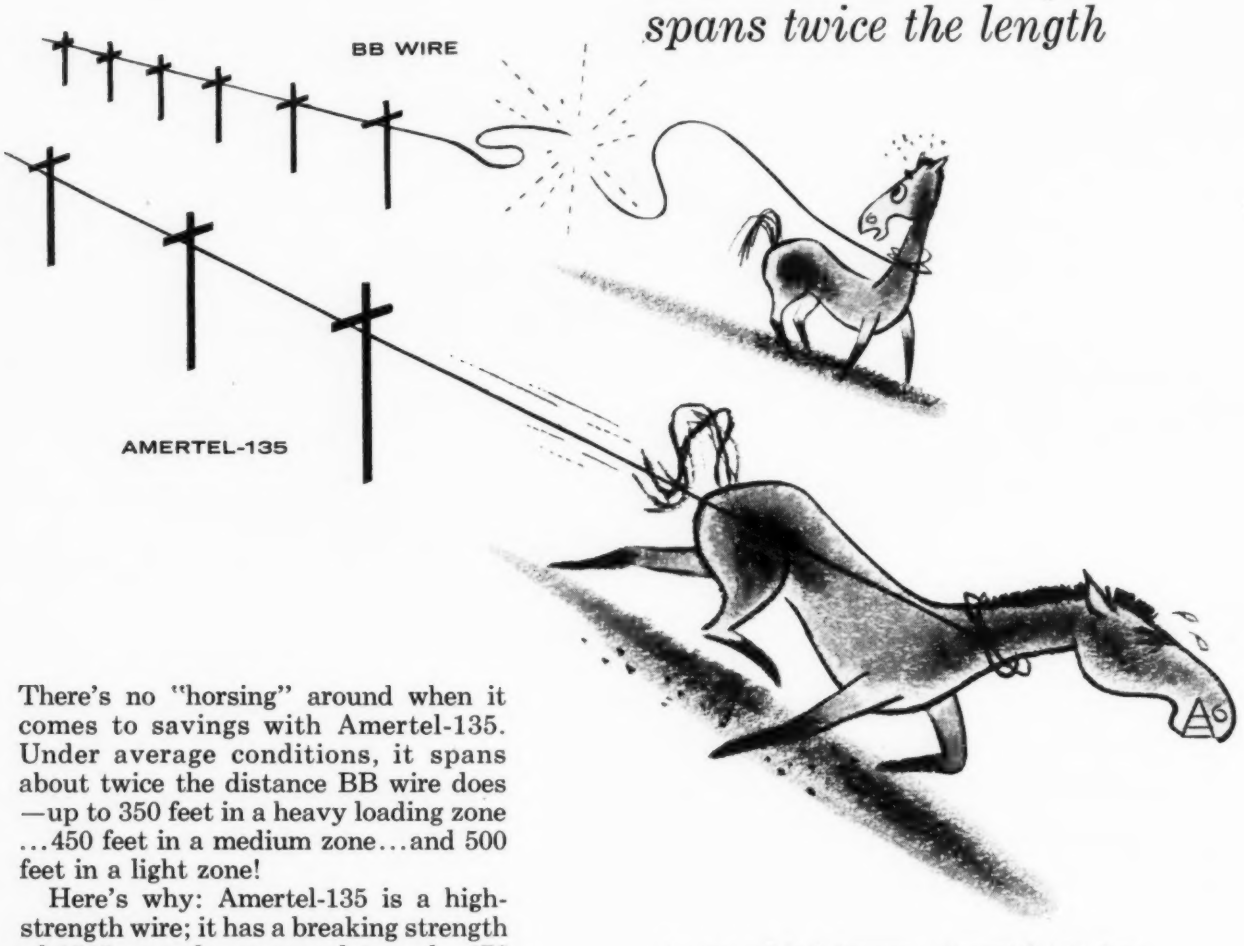

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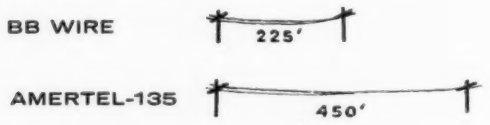

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"Service is Attitude"

Theme of Ohio Convention

By R. C. RENO

A RECORD-BREAKING crowd of more than 600 delegates and their guests convened in Columbus, O., on Mar. 27 and 28 for the 61st annual convention of the Ohio Independent Telephone Association. This year the convention was shortened to a day and a half in order to conserve the time of management personnel during one of the busiest years in the history of Ohio Independent telephony.

The convention sessions were presided over by the officers of the association—President Ralph F. Mateer of Warren and Vice Presidents Weldon W. Case of Hudson and James I. Hunt of Middlefield.

Keynote speaker for the convention was Robert L. Moulton, chairman of the Ohio Public Utilities Commission. Mr. Moulton used the convention theme, "Service Is Attitude," as the subject for his talk. He stressed the point that good employe attitudes are the basis of efficient and friendly telephone service.

Following Commissioner Moulton's address the convention heard reports from the following association officers and committee chairmen: President Mateer; Secretary-Treasurer Daniel W. DeHayes; Herbert J. Vrooman, chairman of the Auditing Committee; G. T. Winn, chairman of the Traffic Committee; E. N. Owens, chairman of the Commercial Committee, and F. H. Wood, chairman of the Plant-Equipment Committee.

During the luncheon program on the first day of the convention, delegates heard a talk by Francis X. Welch of Washington, D. C., editor of *Public Utilities Fortnightly*, and Washington editor of TELEPHONY, whose subject was "Independent Telephony Looks Ahead."

Mr. Welch told the audience that there are now 56 million telephones in the United States and that by 1975 there may be 100 million. He pointed out that the same increase will be true for automobiles, highways, refrigerators, television sets and all other kinds of goods and services. He then posed the question, "What for, and to what purpose." Welch said this is a serious responsibility which the businessman must share with the educators and legislators.

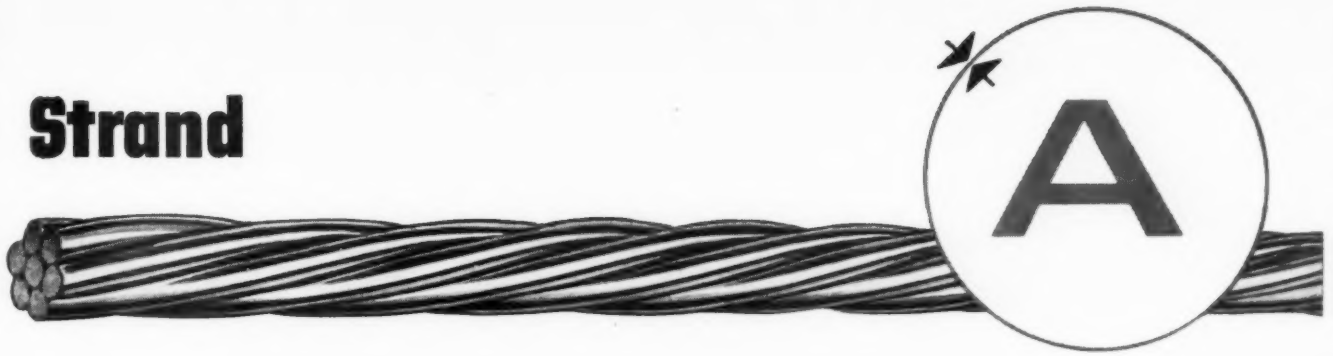
Continuing, he said we hear talk of more mass production, automation, and a shorter working week. He then asked the question of what are we going to do with the benefits of more leisure hours and modern mass conveniences? These are serious social and cultural, as well as economic questions which go into the "know-why" as distinguished from the "know how" of which we Americans are so proud.

He said that one man's "why" is not the same as another man's "why," and that one person may be moved by a personal philosophy, another by a religious ideal, but that the main point is that everyone is able to share and develop individual ideals side by side with our neighbors.

We can do this, Mr. Welch continued, only because we have a way of life, a system of government, an enterprise economy which makes us free to do so, encourages us to do so, and furnishes to each of us, if we are willing to work for it, the wherewithal to do so. No other system on earth, he concluded, can make that claim, and we should all recognize it, be proud of it, and export it as the real goal of our American way of life.

Newly-elected officers of the Ohio Independent Telephone Association are shown talking with Edward McFaul, Chicago, convention luncheon speaker. Shown left to right are Weldon W. Case, of Elyria, president; Mr. McFaul; James I. Hunt, vice president, and D. W. DeHayes, executive vice president and secretary-treasurer.

Strand



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Obviously, corrosive conditions are not the same in all areas. They differ widely. Bethlehem meets this situation by offering strand with *three* different coating weights. The lightest, called A, is the equivalent of extra-galvanized. Coating B is twice the thickness of A. Coating C, which offers the most protection, is triple the thickness of A.

Thus it is always possible to choose a coating that will meet the conditions of any given location. Naturally, all factors being equal, the B and C coatings will greatly outlast the A, although the A-weight does have its place.

What about quality? In all three weights the *quality* of the coating is the same. The difference is merely a matter of thickness. All Bethlehem strand is coated with the same high-purity zinc, applied electrolytically. This special method of application, called bethanizing, insures a jacket so uniform and ductile that it will not crack or peel, even under repeated bending.

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The afternoon of the second day was given over to departmental conferences.

The commercial conference was presided over by Commercial Committee Chairman E. N. Owens. The conference heard T. R. Smith of Mansfield, who spoke on the subject "Station Equipment, Past and Present," and Norman Treadon of Cleveland, who addressed the conference on "Every Manager a Display Man."

F. H. Wood of Hudson presided over the plant-equipment conference and he presented an address on the subject "Plant Training Institute," in which he described the plant school being planned by the Ohio association.

The conference also heard H. L. Smith of the Dow Chemical Co., who discussed "Chemical Brush Control," and T. V. Collins Jr. of Automatic Electric Sales Corp., who spoke on "Plant Expansion With Microwave and Carrier."

The traffic conference was in charge of G. T. Winn of Portsmouth, chairman of the association's traffic committee. Speakers at this conference were George E. Brewer of the General Telephone Service Corp., New York City, who spoke on the subject "Supervision—The Human Side of the Job," and Jack Cluen and Miss Marie Jellison, both of Warsaw, Ind., who presented a skit entitled "Self-Development of a Supervisor."

Highlight of the first day of the convention was the banquet, and guest speaker for this occasion was Dr. Clarence Manion, South Bend, Ind., nationally known authority on constitutional law and former dean of the University of Notre Dame's Law College.

Dr. Manion currently is co-chairman of the patriotic organization "For America," and is heard each Sunday evening in an analysis of national and world news on the Mutual radio network.

The Ohio association presented its Community Service Award plaques to representatives of seven Independent companies in recognition of their outstanding job of improving public understanding of the Ohio Independent telephone industry. From left to right they are: Col. David McC. McKell, president of Chillicothe Telephone Co.; Howard Wright, general manager of Ashtabula Telephone Co.; H. E. Hageman, president of Lorain Telephone Co.; Marvin A. Byrd, general manager of Mansfield Telephone Co.; Herbert Meyer, commercial superintendent of Ohio Consolidated Telephone Co. of Portsmouth; Paul Kaufman, public relations director of Northern Ohio Telephone Co. of Bellevue, and Robert Kaufman, vice president, Continental Telephone Co.

Ralph F. Mateer, president of the Ohio Independent Telephone Association, is shown presenting the association's annual "Beyond the Call" awards in the form of sterling silver trays to this year's winners from the plant department of the General Telephone Co. of Ohio at Pomeroy. The winners are (left to right): Lawrence Diddle, Bobbie Roy, Bill Spencer, and Clarence Roy.

Left to right: Ralph F. Mateer, president of the Ohio association, talking with Dr. Clarence Manion, guest speaker at the convention banquet, and Clare E. Williams, president of the General Telephone Co. of Ohio.

Speaking on the subject "A Declaration for Independents," Dr. Manion told the convention that we cannot defeat Communism in Europe and Asia by surrendering to centralized consolidation of power in the United States. He pointed out that in his opinion decentralization of power, implicit in our Constitutional state rights, is our best defense against Communism.

He further stated that our generation has been bombarded with propaganda which stresses the advantages of big consolidation in industry, labor, education, and last but most important of all, in government.

(Please turn to page 54)

WIRES & CABLES FOR THE *Telephone Industry*

EXCHANGE AREA CABLE

No. 24, 22 and 19 AWG — Soft bare copper, polyethylene insulated, cabled, polyethylene taped, aluminum shielded, polyethylene jacketed. For aerial and duct service.

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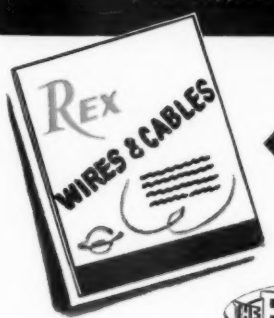

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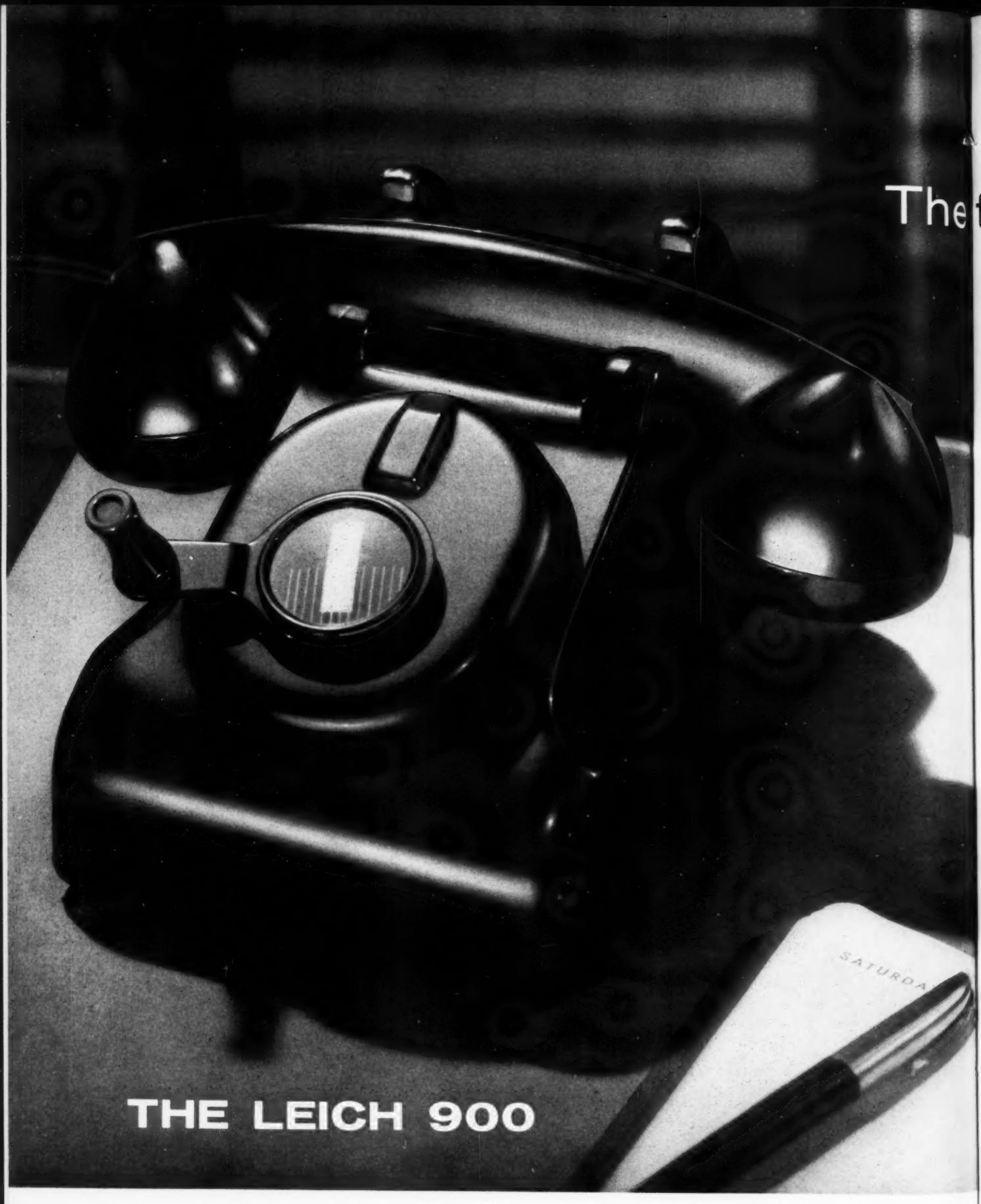

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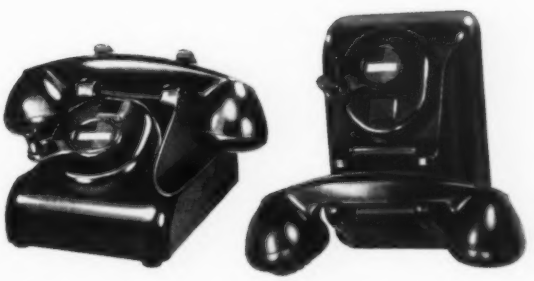
The unique design of this LEICH telephone enables you to offer your subscribers their choice of either wall or desk installation.

Another reason why the Leich 900 magneto telephone is such a sound investment is because it is so easy to convert to common battery or dial service. All it takes is 5 minutes and a few changes.

Here then, is the magneto telephone that offers a new high in magneto service . . . a telephone that was engineered with the problems of a magneto exchange in mind. Try one in your exchange and see for yourself.



use it for wall or desk installation!

No need to order a special model. The Leich 900 is both a wall and a desk telephone. For desk use just set it down. For wall use you simply turn it around and mount it on the wall. No changes are required. Just think . . . you need to stock but one type telephone for every requirement.

so easy to convert!

If your exchange uses Leich 900 magneto telephones and you convert to common battery or dial service, this telephone is still good. It takes just five minutes to remove the generator and change a few wires which changes the circuit to common battery. If you convert directly to dial, all you do is add the dial.

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GENERAL SYSTEM INDEPENDENT

Nevertheless, he stated, we are learning the hard way that there is no inherent merit in mere magnitude. On the contrary, an across-the-board consolidation of power in all fields including government, is the precise formula for the establishment of Communism and the destruction of human freedom.

In conclusion, Dr. Manion told the group that freedom means limited government, but government can only be limited where people first limit their own appetites and activities by moral observances.

Continuing the convention business sessions on Mar. 28, Weldon W. Case, general manager of the Elyria Telephone Co. was elected president of the association for 1956-57 during the annual organizational meeting of the board of directors.

The board also elected James I. Hunt, president of the Home Telephone Co., Middlefield, as the association's vice president, and Daniel W. DeHayes was named to fill the newly-created association position of executive vice president. Mr. DeHayes was also re-appointed as secretary-treasurer.

In addition, Howard Wright, general manager of the Ashtabula Telephone Co., was elected as a director of the association to fill the unexpired term of Richard N. Cole, vice president of Ohio Consolidated Telephone Co., Portsmouth, who resigned.

The membership also re-elected unanimously as directors Mr. Case, H. F. Clapper of Greenville, Robert D. Gott of Wellington, Rolland S. Jones of Athens, George B. Quatman of Lima, and Yetter Snyder of Chardon.

Following the business session, Col. William C. Henry, president of the Northern Ohio Telephone Co. of Bellevue, who also is the liaison officer between the Independent telephone industry and the Department of Defense, spoke on "Operation SAGE."

SAGE (Semi-Automatic Ground Environment) is the name given to the current project to improve the nation's air defense system, to defend it more adequately and efficiently from enemy air attack.

The SAGE project will utilize existing communication facilities of both Bell and Independent telephone companies, which will be leased by the U. S. Air Force.

Col. Henry explained operation of the radar warning system and emphasized that the success of the SAGE system depends upon adequate communications, to be furnished by the commercial telephone industry. He told the Independents that they will be given the opportunity to provide facilities and services in any of their territories where the SAGE facilities are located.

He estimated that the Independents would be called upon to furnish 3,000 circuits with an average of 30 miles per circuit, making a total of 90,000 circuit miles. This, he estimated, would amount to an annual circuit rental of between 8 and 9 million dollars, if all Independent companies assume the responsibility of supplying the SAGE circuits.

During the final luncheon on Mar. 28, seven Independent telephone companies received Community Service Award plaques from the association. These are presented yearly to those companies which are judged as having done the most outstanding job of improving public understanding of the Ohio Independent telephone industry.

Those companies receiving the 1956 award were: Ashtabula Telephone Co., Chillicothe Telephone Co., Continental Telephone Company of Continental, Lorain Telephone Co., Northern Ohio Telephone Co. of Bellevue, Mansfield Telephone Co., and Ohio Consolidated Telephone Co. of Portsmouth.

As another feature of the luncheon, four men from General Telephone Co. of Ohio were rewarded for their heroism with the association's "Beyond the Call of Duty" awards. Each received an appropriately inscribed silver tray.

Those who received this award were: Lawrence Diddle of Syracuse, and Bobbie Roy, Bill Spencer and Clarence Roy, all of Racine. All are employes of the plant department of the General Company in Pomeroy.

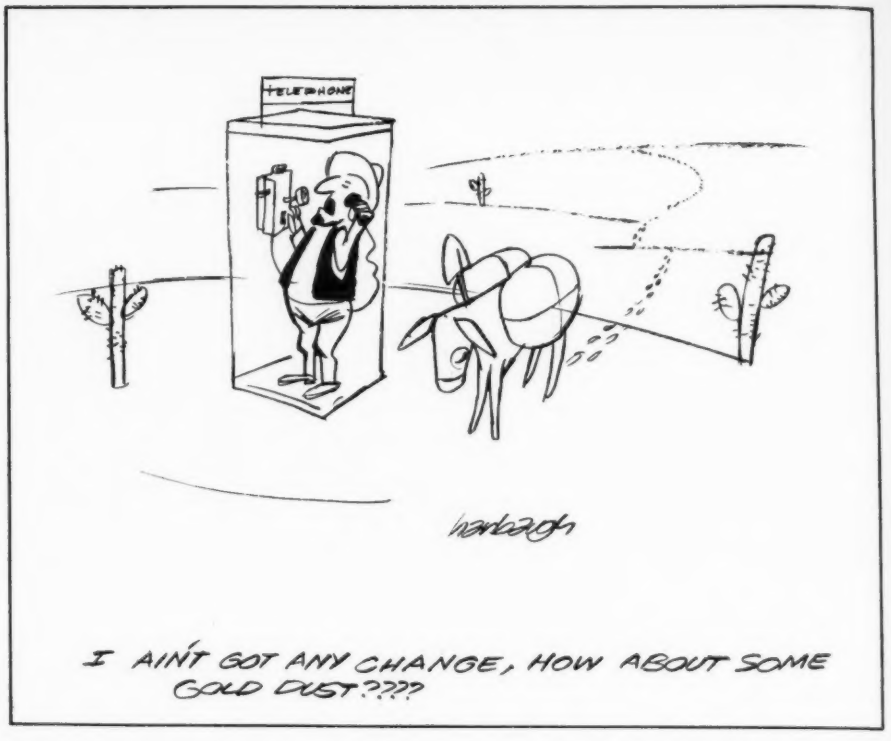
Their heroic act involved rousing a family from a burning house one morning when the four of them were en route to work together. After the family had been removed from the house, the men called the fire department, and while waiting for it to arrive they formed their own four-man bucket brigade to fight the fire. By coincidence, all of them are members of a local volunteer fire department.

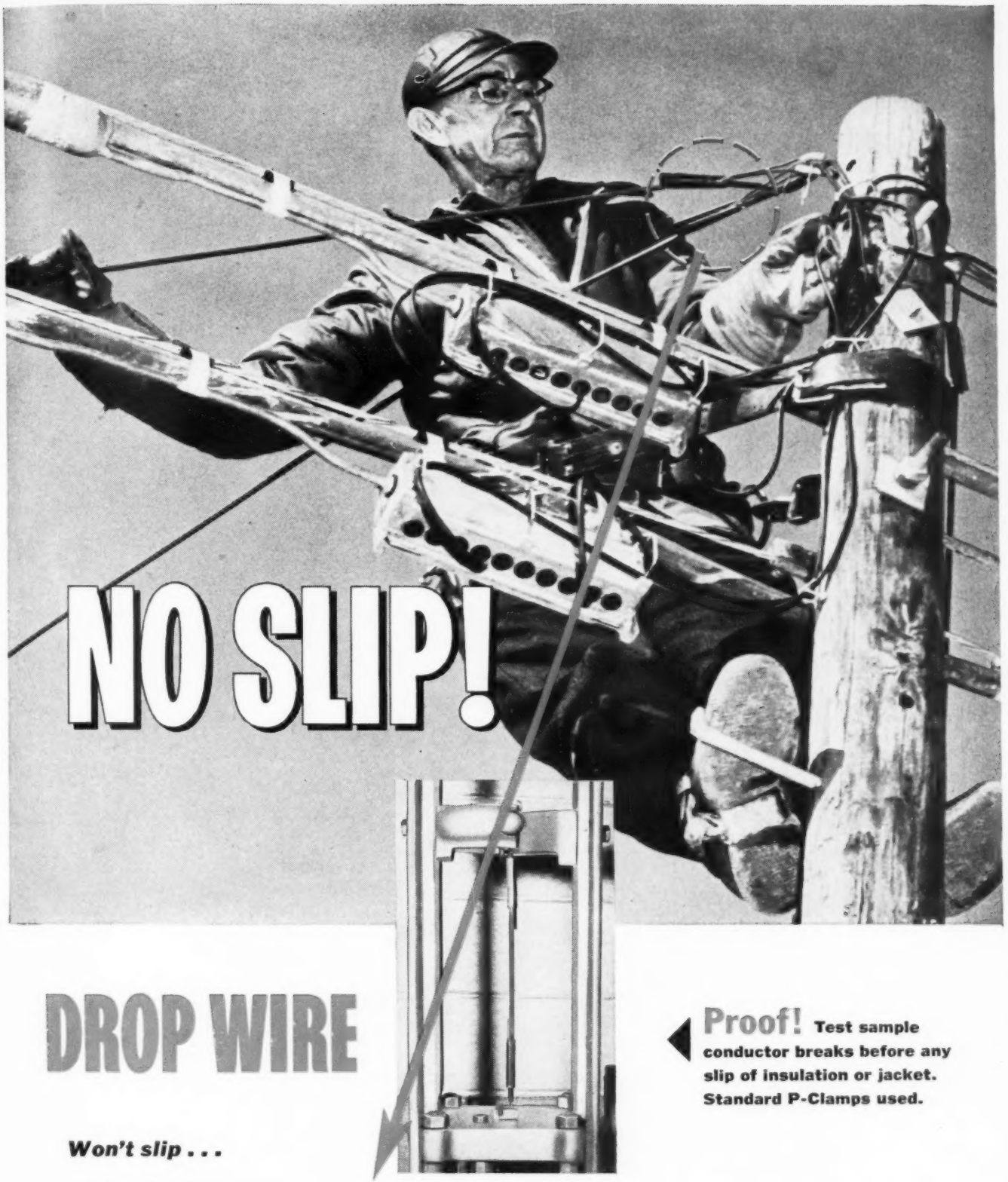
Others who received special citations for "Beyond the Call of Duty" actions in their respective communities were: Mrs. Rheba Tucker, operator for the General Telephone Co. of Ohio at Brookville, O., and Miss Marguerite Boyd, traffic supervisor of Lima Telephone & Telegraph Co.

Speaker for the Mar. 28 luncheon was Edward McFaul of Chicago who entertained the delegates with a humorous and inspirational talk on employe courtesy titled, "With Your Hat In Your Hand."

Free Nations Like Gardens

"A well-kept garden is beautiful and may appear free of pestilence. But every gardener knows the garden's beauty will soon decay and fall into ruin without constant care and protection from weeds, rodents, insects, fungi and its other enemies. A free nation is like that garden. It must be everlastingly guarded against enemies within as well as without who would gradually eat our freedom away, until the stage is set for the final destruction of representative government dedicated to maximum liberty and opportunity for all."—*Industrial News Review.*





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XUM

today's Highlights

of finance-taxes-business trends

by Willard F. Stanley

HIGHER INTEREST: The drastic upswing in interest rates on utility bonds pre-empts the spotlight this month. When our last column was released, bond yields had already moved upward considerably. Since then this upward movement has continued unabated.

Eleven utility bond offerings, tabulated in the Mar. 21 Wall Street Journal showed average yields, based on bid prices, 2½ decimals (.025 per cent per annum) above the average yields at which these bonds had been originally offered. As of Apr. 19, new utility bond issues, tabulated in the Wall Street Journal, at bid prices, show average yields about 16 decimals (.16 per cent per annum) above the average original offerings—an indicated upward swing of 14½ decimals. But actually the yield basis on new offerings of A-rated utility bonds has risen nearly 50 decimals (½ of 1 per cent per annum) within the last month or so—from less than 3.35 per cent to over 3.80 per cent.

While we had anticipated some upturn in bond interest rates this sudden change in the bond market is unexpectedly drastic. No doubt the ingredients are many. One major contributing factor is the unusual amount of funded debt securities recently offered. Nor does the future seem to hold relief in this respect.

Over 160 million dollars of utility funded debt is scheduled for offering in May, compared with around 240 million dollars offered and scheduled to be offered in April. Both these figures are considerably above normal. Furthermore, in the offing is the 250-million-dollar American Telephone debenture offering projected for June, plus two industrial funded debt issues averaging approximately equal size.

This may add up to high interest rates for some time to come—unless there is a substantial rescheduling of offerings, to spread out the supply in an orderly manner. Institutional demand is still lessened by continued major investments in mortgages on homes, with home construction still running very high—above what most experts contemplated for 1956.

Recent developments in the short-term money market have increased the federal reserve rediscount rate to 2¾ per cent in most districts, and the prime rate for commercial bank loans to 3¾ per cent (both the highest levels since the early 1930s). Rates for commercial paper also nudged upward while treasury bills pierced the 2.75 per cent level—all adding up to a consistent pattern of higher costs for both long and short-term funds.

For many months our suggestion as to funded debt offerings has been in favor of prompt sale of bonds for near-term needs, but now, due to recent events, the matter has entered an area of perplexity.

It is axiomatic that utilities should usually finance "as they go," and not strive to glean from crystal ball gazing what the money markets will do in the future. However, like every other rule, there is an exception to this one. Such an exception could logically apply when bond yields pass above what might be

Mr. Stanley, formerly financial vice president of Southwestern Public Service Co., an electric utility with over 160 million dollars in assets, is president of Corporate Services, Inc. of New York City. He is a member of Controllers Institute of America and New York Society of Security Analysts. He serves on three committees of the Controllers Institute having to do with federal taxation, social security and finance management. His articles are appearing once a month in TELEPHONY.

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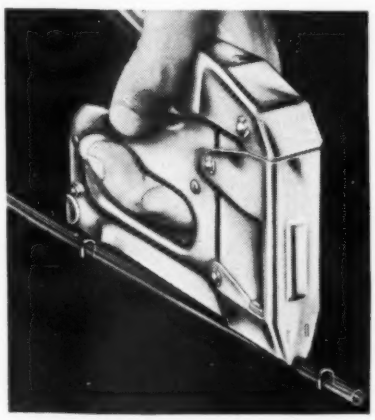

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called the maximum limit in the normal range of rates. Opinions will differ as to just what this range of rates should be, but we would be inclined to place the low end of this range at 3.25 per cent for A-rated utility bonds and 3.75 per cent for the high limit—with comparable spreads for bonds of higher ratings.

This reasoning indicates that whenever A-rated bonds must be offered at a yield as high as 3.75 per cent or more (as is the case as this is released), deferral of the offering merits consideration. Naturally, there can be no assurance the company may not lose by waiting, if yields continue to rise and do not react before the financing must be done. But if deferral for as long as six months seems feasible without financial complications, the odds should favor lower yields arising within such a period.

Even in the peak-yield period of the late-spring early-summer of 1953, when A-rated bonds were offered as high as 4.20 per cent, the yields continued above 3.75 per cent only for a few months. By that September, A-rated bonds were being offered as low as between 3.20 per cent and 3.30 per cent. History need not repeat itself, but serious consideration is urged before committing to pay more than 3.75 per cent for A-rated bonds, or comparable rates for better grade funded debt.

Preferred stock offerings have been scarce, probably accounting for the fact that the rise in preferred stock dividend rates has not been as drastic as that in yields on funded debt. Forthcoming issues may test the market for this type of security and result in increased rates comparable to the rise in interest. Deferral of necessary preferred stock financing holds more dangers than in the case of funded debt.

On the other hand, higher preferred stock dividend rates have greater proportionate impact on earnings, because the percentage cost is greater and, even more important, because no part of the increased dividend rate can be absorbed in federal income tax deductions.

* * * *

COMMON STOCK EQUITY MONEY: After the radically unfavorable turn in the bond market, it's pleasant to return to common stock equities, where high prices and relatively low yields still persist. In this area our former recommendations stand: Take advantage of the continued "green light" for this type of financing and raise funds in this category which may be needed up to at least a year hence.

Earnings of most utilities continue to increase and this should lead to higher dividends and enhanced market values—barring a general market recession. Where substantial improvement in these respects seems reasonably assured in the near future, temporary deferral of common stock financing may be justified; otherwise the way of wisdom seems to lie in taking advantage of the favorable market now existing.

* * * *

SHIVERY STOCKS: After releasing last month's story on the stock market, the averages pierced the all-time tops for a brief new high, but then reacted to levels below a month or so ago. New York Times' 50-stock average stands at just about the Dec. 31, 1955 level as this is released (Apr. 20), compared with a rise above that level of about 3 per cent as of Mar. 21.

Recent market breaks are said to reflect fear of hostilities in the Near-East (Israel-Egypt-Arabia) and of our possible involvement. We hope and believe these fears will prove groundless. The market may derive some recent weakness from the increase in the rate on brokers' loans, but it seems unlikely this is a major derivation, because of the relatively small amount of stock held on margin.

On the subject of derivations, in a light vein, a question arose recently as to where the expression "Gosh all hemlock" had its genesis. This expression is believed to be particularly prevalent in New England. Someone offered the solution that it may have been first uttered by Socrates when they handed him the cup of hemlock with which he was to kill himself.

* * * *

IN GENERAL: Barring drastic developments internationally, the outlook remains favorable. The business picture still has a rosy cast in almost all directions. Earnings continue to rise, in the great majority of cases, and government seems primarily interested in keeping the "boom" from running away by a continued policy of firm money rates. Recent tightness in short-term rates signalizes the seasonal demand for funds to meet income tax payments.

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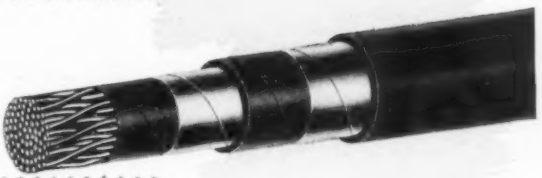
Superior's Type TEL CA cable is recommended for direct burial installation as well as for aerial and duct use. Contains all of the features of Type TEL C **plus** extra mechanical protection obtained with an additional polyethylene jacket separated from the other by 26 mil aluminum armor. Supplied in 16 to 404 pairs, quads or composite.



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This self-supporting Superior Cable uses 6 or 16 pairs of 24 gauge soft copper polyvinyl chloride insulated conductors cabled around a .109 polyethylene insulated steel support wire. It is fully color-coded. Recommended for short run installations where demand for service is high and low-cost construction and installation is required.

RURAL DISTRIBUTION CABLE

Superior's RDC is recommended for the extension of needed telephone facilities quickly and economically through rural areas where long runs are required. Paired using 20 mil polyethylene — 10 mil polyvinyl chloride insulated 19 AWG soft copper conductors twisted around a polyethylene insulated, high strength galvanized steel support wire. Conductors fully color-coded. Supplied in 1 through 16 pairs.

INTERCOMMUNICATION CABLE

Superior Cable's Intercommunicating, Inside Telephone and Sound System Cables are manufactured of the highest quality insulating and jacketing materials to guarantee excellent service and long life. Fully color-coded to insure positive identification of conductors at any point.

"SUPER-SPLICE"®

Originated and developed by Superior Cable. This polyethylene sleeve provides a means of restoring the insulation and moisture-resistant properties of polyethylene conductors in communications and signal cables where the insulation must be removed in order to splice the conductors. "Super-Splice" comes filled with an insulating and waterproofing material which never hardens but maintains the same consistency over a wide temperature range. Available in various diameters, color-keyed. All sleeves 2⅛" long.

Buy Superior Cable from SUPERIOR CABLE

ALL SUPERIOR CABLES are completely insulated and sheathed in polyethylene or plasticized polyvinyl chloride. These modern plastics have been proven to be better electrically, chemically and physically than any other insulating and jacketing materials.

ALL SUPERIOR CABLES are subjected to the most exhaustive research and tests prior to delivery. They are manufactured with modern machinery in a modern plant employing the most advanced engineering techniques.

ALL SUPERIOR CABLE is fully guaranteed to be satisfactory in design, materials and workmanship in accordance with the applicable specifications.

For detailed information, write

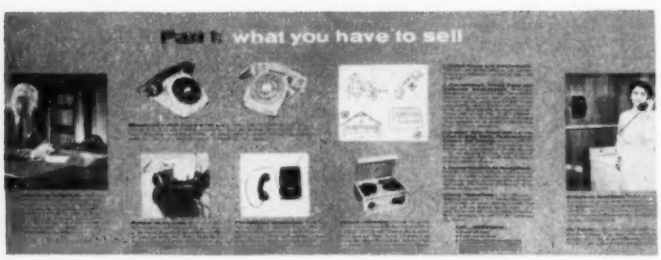
SUPERIOR CABLE

SUPERIOR CABLE CORPORATION, HICKORY, N. C.

XUM

Everything you need!

Here's a bird's-eye view of the New-Business Kit which contains newspaper ads, publicity releases, promotional folders—and a wealth of proved practical revenue-boosting tips.



(a)

(b)

King-pin of the kit

is this helpful guide "Ideas for Building Business." Pages shown *at left* are: (a) products being promoted successfully today, and (b) a complete plan for promoting them.

XUM

did you get your copy?

Automatic's New-Business Kit, we mean! It's a definite must, if you want to sell the extra services that mean extra revenue.

It's chock-full of modern, proved sales helps.

What's more, it shows you how, when, and where to use them! It gives you a practical plan that includes sales training, publicity, newspaper advertising, direct mail, displays, and signs. It also includes helpful tips on promoting extensions, telephones in color, and other popular products and services.

Did you get your kit? If you didn't, drop us a note. We'll be happy indeed to send it out by return mail. Ask for Circular 1858.

Address: *Automatic Electric Sales Corporation, 1033 W. Van Buren St., Chicago 7. Or call HAymarket 1-4300.*

AUTOMATIC ELECTRIC

ORIGINATORS OF THE DIAL TELEPHONE

GENERAL TELEPHONE SYSTEM

Courts and Commissions

May Remove Telephones on Evidence of Bootlegging

Circuit Judge John M. Kelly on Apr. 14 ruled in Knoxville, Tenn., that Southern Bell Telephone & Telegraph Co. on its own investigation or by notice of a reputable law enforcement official may remove telephones from bootlegging establishments.

The decision, the first of its kind in Tennessee, came in a case in which former assistant Atty. Gen. T. Mack Blackburn charged two telephones at the former bootlegging place of Richard Vance were used to receive whiskey orders.

The court cited a regulation of the Tennessee Railroad & Public Utilities Commission that telephone companies may refuse service when there are "reasonable grounds to believe that such service will be used in violation of the law."

Judge Kelly said the question of telephone removal has never been considered by Tennessee courts and that authorities in other states are divided on the matter.

West Coast Asks to Raise Rates in Oregon

West Coast Telephone Co., Everett, Wash., on Apr. 12 applied to the Oregon Public Utilities Commissioner for a rate increase that would raise revenues from the company's Oregon exchanges approximately $318,000 a year.

The tariff filing asks for the rate increase to assist in financing a 6-million-dollar construction program, according to a statement from Ray Dalton, company vice president and general manager.

Ill. Companies Ask to Sell, Raise Rates, Issue Note

Cases recently scheduled to appear before the Illinois Commerce Commission were:

Application of the Albany Telephone Co. for proposed increases in rates, and for authority to issue a $15,000 promissory note, to be heard on Apr. 25.

Application of the Forest City Telephone Co. to sell its San Jose exchange to Illinois Bell Telephone Co., to be heard Apr. 26; also application of the Forest City company to sell its Forest City exchange to Middle States Telephone Co. of Illinois, a subsidiary of Central Telephone Co.

California Company to Buy Another; Changes Name

Los Gatos (Cal.) Telephone Co. will change its name to the Western California Telephone Co., as a result of its expanding operations, it was announced recently.

The company has agreed to purchase the Kenwood exchange in Sonoma County.

The purchase was reported as awaiting approval by the California Public Utilities Commission.

Hold Hearings on Discharges in Southern Bell Strike

Decisions involving 55 employes who were discharged during the Southern Bell Telephone & Telegraph strike in six states were handed down recently by arbitration teams composed of three to four members.

Decisions involving nine employes in Tennessee were reached. Misconduct was found in all of the cases, but ruled not serious enough for discharge, and suspensions were ordered, ranging from one to six weeks. The cases included:

At Nashville, three persons charged with participating in a demonstration and throwing eggs at working employes. One was suspended for four weeks, the two others for two weeks.

At Dyersburg, six employes were charged with intimidating and harrassing working employes. One was suspended for six weeks, three more for two weeks, and two for one week.

Decisions in 11 more cases involving Tennessee employes were handed down.

The discharge of two employes was upheld. Misconduct was found in all other cases, except one, but was not judged serious enough to warrant discharge and suspensions were ordered ranging from two to ten weeks. The cases included:

One in which the defendant was charged with threatening and intimidating working employes, discharge upheld.

The other ten cases included a series of incidents at Dickson. The discharge of one employe charged with throwing eggs at working employes and participating in a demonstration at the residence of a working employe, was ordered upheld. Another was cleared of a charge of throwing eggs and ordered reinstated with full back pay.

Six employes at Dickson were charged with throwing eggs and participating in a demonstration at the residence of a working employe. They received suspensions of from 8 to 10 weeks.

Two more residents of Dickson were charged with throwing eggs. One was ordered suspended for three weeks and the latter for two weeks.

In Georgia and Florida, decisions in eight cases were handed down.

In five of the cases, discharge of the employes was upheld. Misconduct was found in the other three, but ruled not serious enough to warrant discharge, and suspensions were ordered ranging from two to five weeks. The cases included:

Three employes charged with assault on working employes, discharges upheld.

Two defendants in Savannah, Ga., were charged with removing coin telephone stations, discharges upheld.

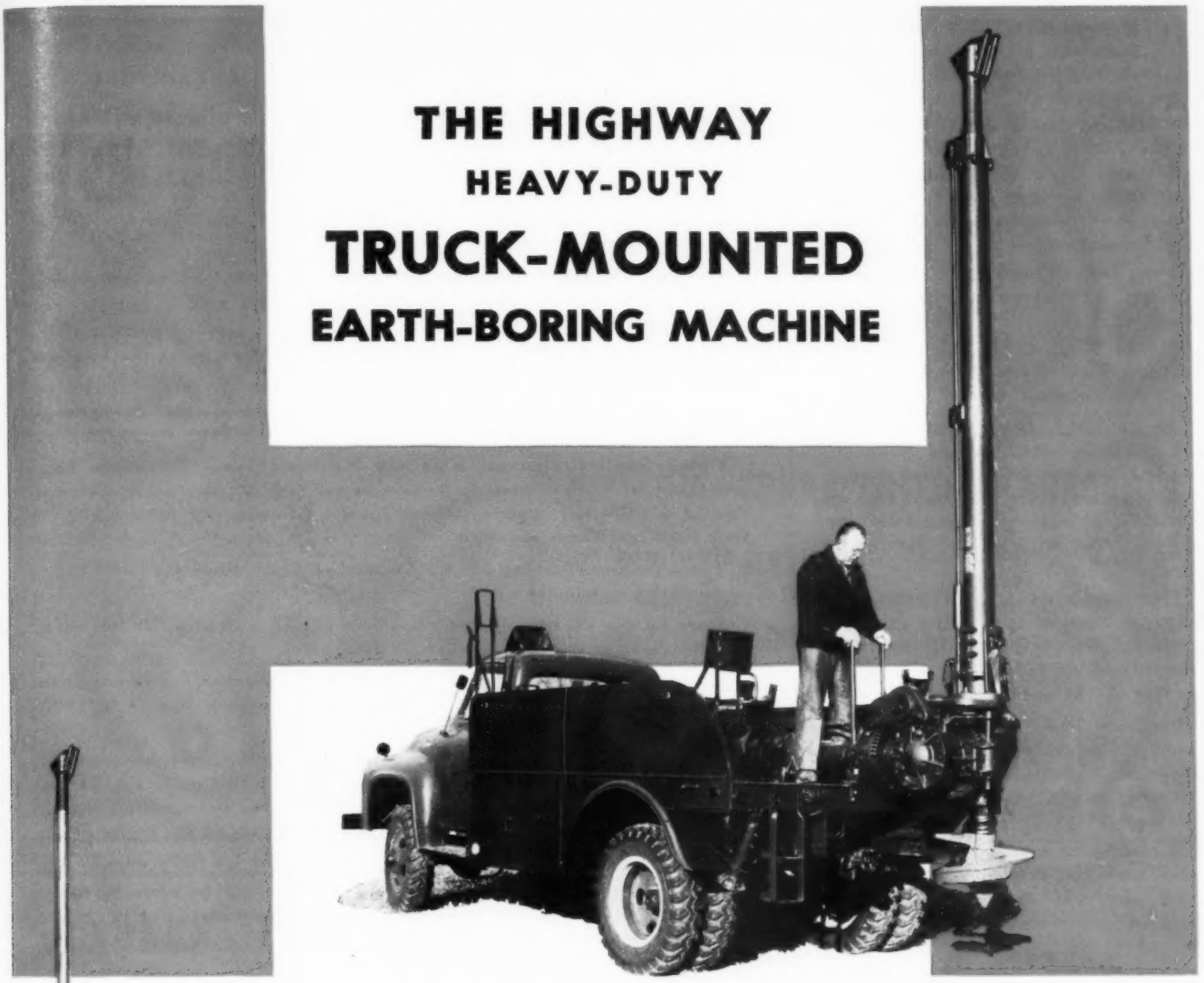
Two employes in Brunswick, Ga., were charged with shooting ink in water pistols at working employes and throwing eggs and other objects at working employes. The former was suspended for five weeks, the latter for two weeks.

One defendant in Jacksonville, Fla., charged with disconnecting a coin telephone, was given a two-week suspension.

Decisions in 12 cases involving Louisiana and Mississippi employes have been handed down. An additional case was withdrawn from arbitration at the request of the union.

Misconduct was found in all cases except one, but was not judged serious enough to warrant discharge. In 11 of the cases suspensions were ordered

THE HIGHWAY
HEAVY-DUTY
TRUCK-MOUNTED
EARTH-BORING MACHINE



Exclusive!

Highway's Telescoping Derrick

The telescoping derrick, 3500-lb capacity, can be extended to more than one-half its collapsed length. Available as optional equipment on the Model "HC" machine.

Modern . . . Rugged . . .Versatile . . . Efficient . . .
digs at any angle up to 90° in any soil condition — even rock when equipped with special auger...convenient controls...sets big poles

The Highway "HC" earth-boring machine is designed and built rugged and sturdy, for tough daily use. The power-operated "HC" can be quickly adjusted to dig at any angle up to 90° — auger bar and pole derrick raised from traveling to working positions by power. Light enough for mounting on a minimum 16,000-pound G. V. W. truck, the "HC" digger requires only 7 square feet of platform space. Convenient controls are easily accessible and Highway design provides complete safety for both operator and machine.

The "HC" earth borer digs holes from 9 to 36 inches in diameter, up to 10 feet deep. A 2500-lb. capacity winch and pole derrick (optional equipment) can handle 40′ to 45′ poles.

HIGHWAY TRAILERS

HIGHWAY UTILITY DIVISION

HIGHWAY TRAILER COMPANY

HEADQUARTERS: EDGERTON, WISCONSIN

Manufacturers of

Public Utility Bodies • Earth-Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-offs • Service Accessories • Commercial Trailers • Trailerized Tanks and Dry Bulk Haulers

SALES AND SERVICE IN PRINCIPAL CITIES

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ranging from 4 to 10 weeks. In the 12th case, the employe was ordered reinstated with full back pay. The cases included:

A Biloxi, Miss., employee charged with misconduct, four-week suspension.

Defendant in Louisiana, charged with throwing eggs and torpedoes in vicinity of working employes, four-week suspension.

Two Lake Charles, La., employes charged with throwing missiles, ten-week suspension.

Six persons, all of Lake Charles, charged with throwing missiles, six-week suspension.

An employe from Bogalusa, La., charged with harassing and intimidating working employes, six-week suspension. Another from Bogalusa, charged similarly, no misconduct found and employe ordered reinstated with full back pay.

The case of a Lake Charles, La., employe, charged with being in crowd throwing missiles at working employes, was withdrawn from arbitration at the request of the union.

Decisions in 15 additional cases involving Georgia and North Carolina employes of Southern Bell discharged during the strike last spring were handed down.

Misconduct was found in eight of the cases and the discharges of two of these employes was upheld. Suspensions of two weeks were ordered for six others and seven employes were ordered reinstated with full back pay. The cases included:

A Georgia employe charged with intimidating working employe by ramming his car into the rear of his automobile, discharge upheld.

A Waycross, Ga., employe charged with assault by squirting liquid in the eyes of working employe, discharge upheld.

A Valdosta, Ga., employe, charged with cursing and threatening working employe with knife, cleared of charges and ordered reinstated with full back pay.

Four defendants of Tifton, Ga., charged with blocking, obstructing and assaulting working employes, two-week suspensions. Another employe, also of Tifton, facing the same charges, cleared of charges and ordered reinstated with full back pay.

Two Atlanta, Ga., employes charged with destruction of telephone receiver, cleared of charges and ordered reinstated with full back pay.

Two employes from Valdosta, Ga., charged with assaulting and intimidating working employes, were given two-week suspensions. Two more employes from the same town, facing same charges, cleared and ordered reinstated with full back pay.

A Raleigh, N. C. resident, charged with assault on working employe, cleared of charge and ordered reinstated with full back pay.

So far, 170 cases have been decided. Misconduct was found in 119. Of these, 41 discharges were upheld and the penalty lightened to suspension in 78 cases. Fifty-one were reinstated without penalty.

17-Year-Old Son Father's No. 1 Lineman

Eight years ago, Tommy Smelser of Bogata, Tex., strapped on his first set of spikes and scurried up his first telephone pole, reports the Dallas (Tex.) *Times Herald*.

And now, at a mere 17 years of age, Tommy is the ace lineman and trouble-shooter for his dad's telephone company, the Northeast Texas Telephone Co.

"No more dangerous than walking along the street," shrugs the ambitious young telephone man, "if you watch your step."

Tommy has climbed more telephone poles and answered more trouble calls than any youth his age in Texas. He started early, at the impressionable age of 9.

"It's fun," the Bogata High School senior explains simply. "Something new to learn all the time."

Young Smelser's parents head the Northeast Texas Telephone Co., which serves 900 telephone customers in the Bogata area. Upon completion of a $600,000 expansion program the company will serve 1,600 in four northeast Texas counties.

Tommy's first climbing was up his mother's clothesline post with a set of borrowed spikes. He was 9.

Since he was 12, the youngster has been climbing steadily. He has worn out three sets of spikes and fallen off four poles.

Most every pole up and down the 100 miles of Smelser's company lines has felt Tommy's spikes. The first evening he went to Bogata in 1947 he answered a trouble call with his dad.

Since that time, he has done every sort of installing, trouble-shooting and even a bit of switchboard work. The task is a full order for a high school student but Tommy found time to play on the Bogata High School football team during the past fall. And he's president of the senior class.

Tommy figures he'll make the telephone business his life's work.

Next September he will enroll at Texas A&M where he plans to study electrical engineering and specialize in communications.

And when Tommy graduates from Texas A&M, the Smelsers have a vice presidency in the company awaiting him.

Obituary

VERNON B. BAGNALL, 50, of Glen Ridge, N. J., an executive of the Long Lines Department of the American Telephone & Telegraph Co., died in Montclair, N. J., on Apr. 10 after a heart attack.

He organized the plans for the distant early warning (DEW) line, which is being built at the Arctic Circle to warn of approaching enemy aircraft. The Western Electric Co., a subsidiary of AT&T, undertook to build the network at the request of the Department of Defense.

Born in Jacksonport, Wis., Mr. Bagnall joined AT&T after his graduation from the University of Wisconsin in 1927. He served as a colonel on the staff of the Army's Chief Signal Officer during World War II, and participated in the planning of the communications for the D-Day invasion.

After the war, he became general commercial manager of the Long Lines Department of AT&T, and was later general plant manager and director of personnel. He was appointed general manager of the western area, with headquarters in Kansas City, Mo., in 1951. In January of this year he became assistant director of operations of the Long Lines Department in charge of engineering.

Mr. Bagnall was a member of the Institute of Radio Engineers and the Armed Forces Communications & Electronics Association. He was a fellow of the American Institute of Electrical Engineers.

Surviving are his widow, Mrs. Edith Burgeson Bagnall; a daughter, Beverly Ann; a son, Robert Jay; three brothers and a sister.

Cooperative Incorporates in South Dakota

A charter of incorporation was issued recently to the Meckling (S.D.) Cooperative Telephone Co., which will operate 14 miles of line in Clay County, it was reported on Mar. 28.

The company capitalized at $10,000 and listed as directors L. H. Ahrendt, R. J. Kain, Eiler F. Jensen, George Larson and Vivian C. Albers, all of Meckling, and John F. Sealey, Vermillion.

C. J. Fain Named Assistant To REA Administrator

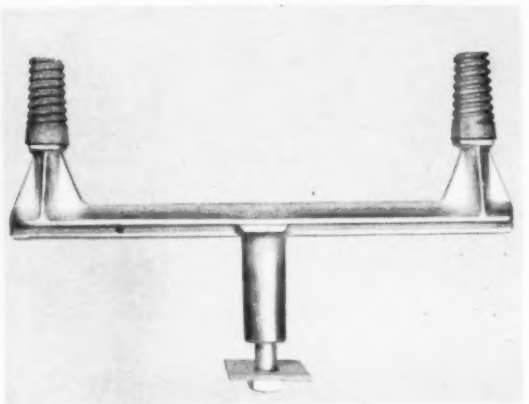
Appointment of Charles J. Fain of Branson, Mo., as assistant to the administrator of the Rural Electrification Administration was announced on Apr. 17 by the U.S. Department of Agriculture.

For the past two years, Mr. Fain has been associated with the National Rural Electric Cooperative Association in Washington, D. C., first as legislative assistant, then as assistant general manager.

Before joining the staff of the cooperative association, Mr. Fain practiced law in Branson. His background includes four years in the Missouri State Legislature where he served as Speaker pro tem and four years in the U. S. Air Force during World War II. He is a graduate of the University of Missouri Law School.

Illinois Independent Sold

Mr. and Mrs. Charles Narup have sold the Fieldon (Ill.) Telephone Co. to Mr. and Mrs. Ted Narup of Fieldon.



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3 GRADES · EACH IN 2 SIZES (.065 and .045)

Type 430 · for use with galvanized messengers
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Furnished six coils in cardboard carton (minimum order).

Other fine-quality products · You can depend upon PAGE Strand (Stainless or Galvanized Steel) and PAGE Stainless Dead-End Wire · See your Telephone Supply Distributor, or write our Monessen, Pa., office.

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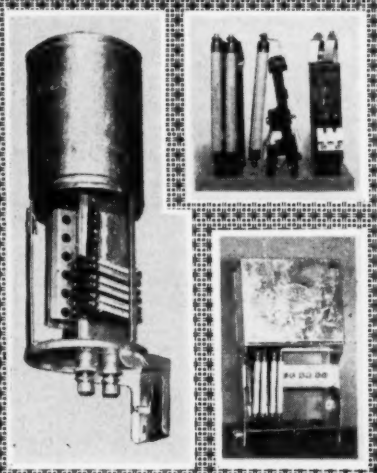
Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

ACCO

Quality Products Shown in the Suttle Catalogs



Cook outdoor protection is just one of the many first-line class of products listed in detail in Suttle catalogs. And always with prices up to date. Always keep the Suttle catalog handy!

S-20V CABLE TERMINALS

Like other Cook protection using interchangeable H-20 protector units, you never tie up money in useless fuses and discharge blocks when you use these terminals on your plastic cable. Nor does any other system provide easier replacement of burned-out protection.

S-LINE U-TYPE PROTECTOR

The handy miniature application of the S-20 principle that is so useful and so efficient at the end points of cable distribution, or congested drop wire areas.

See Your SUTTLE Catalog

Serving Independent Telephone Men Since 1910

Suttle EQUIPMENT CO.

LAWRENCEVILLE ILLINOIS

U. S. Steel's Kitchen Campaign Features Telephone

As part of its recently announced promotion of all-steel kitchens, which features the telephone, U. S. Steel has prepared a five page "Kitchen Call" newspaper kit, which is being mailed to publishers of all daily newspapers in the United States (see cut).

The promotion is built around the slogan "The Call Is for Kitchens . . . Styled in Steel," and uses the symbol of a telephone held in a lady's hand. An extension telephone is shown in illustrations of the all-steel kitchen.

The kit illustrates the 1000-line U. S. Steel "Kitchen Call" ad which will appear in two colors (where possible) in 253 newspapers in 131 television market areas. The ad will run on May 23, climax date of the "Kitchen Call" promotion.

Local cut-ins on a "U. S. Steel Hour" television commercial on May 23 will name the newspapers carrying U. S. Steel's "Kitchen Call" ad that day as the best source of names and locations of steel kitchen dealers.

This unique newspaper-television tie-in will supply powerful impact to the entire "Kitchen Call" promotion and will multiply the benefits to all who tie in. Telephone companies are asked to tie in with the all-steel kitchen promotion, with advertising and publicity featuring kitchen extension telephones.

Composed largely of news feature matter for special "Kitchen Modernization" sections or run-of-the-paper "Modern Kitchen Planning" features, the Kit furnishes newspapers with informative material designed to interest its readers in kitchens styled in steel.

The kit, which contains prepared ads for use by telephone companies and utilities and other local businesses, will be of assistance to telephone companies which may want to participate in the campaign.

Mats of all advertising illustrations and news feature photos in the kit are offered free on request to newspapers in the U. S. Glossy prints of the news feature photos of modern kitchens are also free on request.

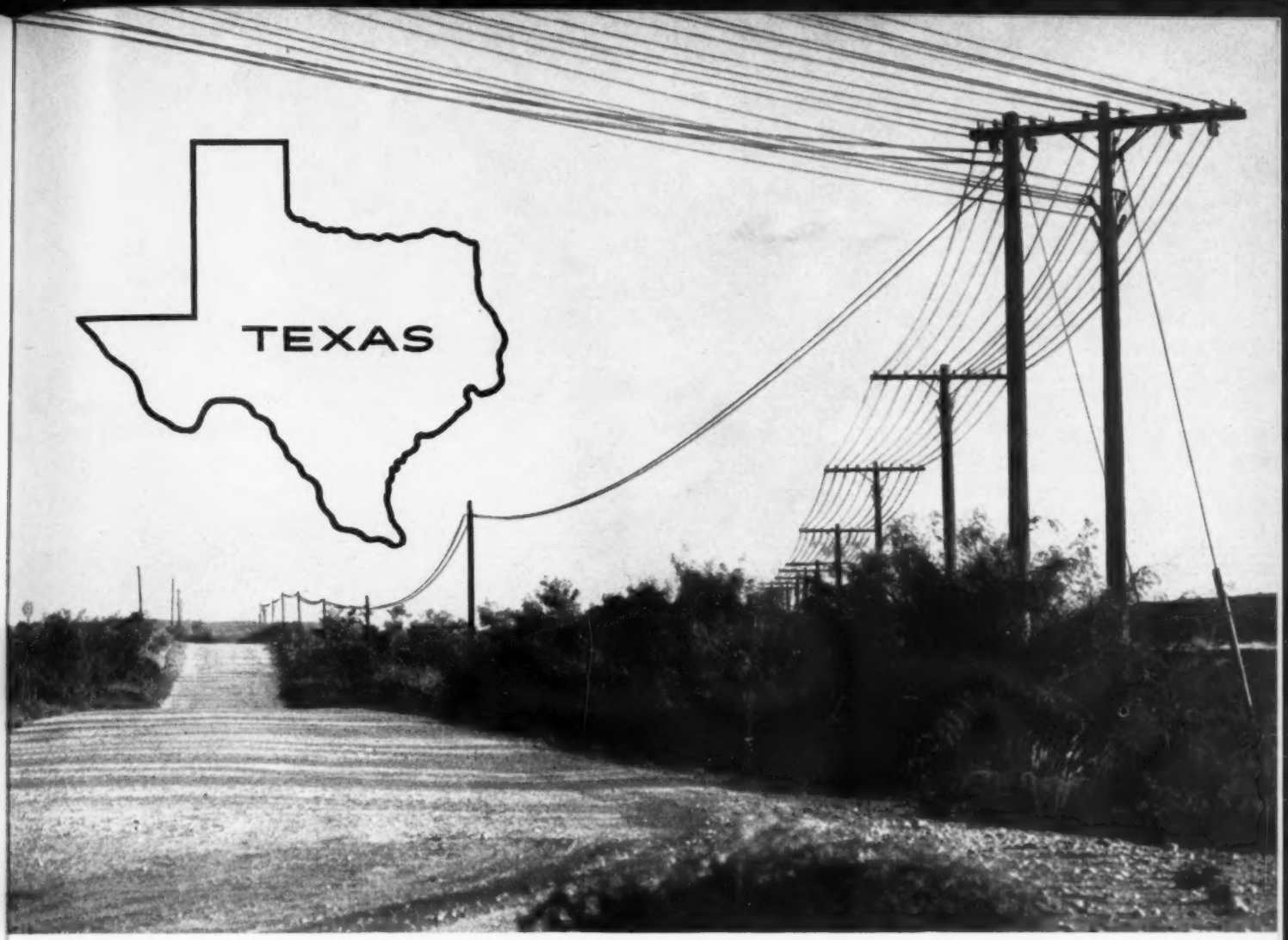
In addition, newspapers not on the schedule to receive the 1000-line U. S. Steel ad are authorized to use the ad illustrations and layout for advertisements sponsored by local accounts. Mats of the basic ad art are offered, and examples of possible uses are given.

As stated, kits will go to publishers of all dailies. Twenty-five hundred copies are also being distributed with the Senior Edition of the May issue of Metro Newspaper Service, in the U. S., so that the advertising managers may have them for immediate use.

Telephone companies interested in tie-in advertising and publicity material should contact their local newspapers.

Appeal for State Action

"Where people are able to do things for themselves, they should not lean on the federal government or the state. I think the local people should step out and do the things themselves, and whether it's public or private [power development] is none of my affair."—DOUGLAS MCKAY, *Secretary of the Interior.*



Here is a side-by-side comparison

⅓ fewer poles *with polyethylene covered cables!*

These parallel telephone lines illustrate the savings possible with polyethylene-covered cable. The extremely light weight of polyethylene results in an extremely light cable. Here, the new lines require ⅓ fewer poles. The compact cable construction eliminates the need for crossarms.

Over a million pair-feet of this cable are in service and 70 million more are on order for this section, where climate varies from semi-tropic to semi-desert. The polyethylene jacket must withstand heat, cold, wind, icy and arid conditions. When cable is placed underground, as in urban areas, the polyethylene resists corrosion by stray electric currents in the earth.

This performance in Texas is matched by a great number of similar successful installations in all parts of the country.

BAKELITE Brand Polyethylene and Vinyl Plastics have established a record of dependable performance not only in telephone service but for signal control cable, utility line wire and service drop, power cable and coaxial cable. These materials meet IMSA specifications for fire alarm and signal control cable; ASA standards for weatherproof wire; ASTM D1238-52T Type II, dielectric materials; as well as REA requirements for plastic-covered telephone wire.

Developments in the use of BAKELITE Polyethylene and Vinyl Plastics are reported regularly in Bakelite Company technical publications, available without cost. Much of this information has considerable significance for the telephone industry. To keep informed, write today to Department PV-180.

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BRAND
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BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

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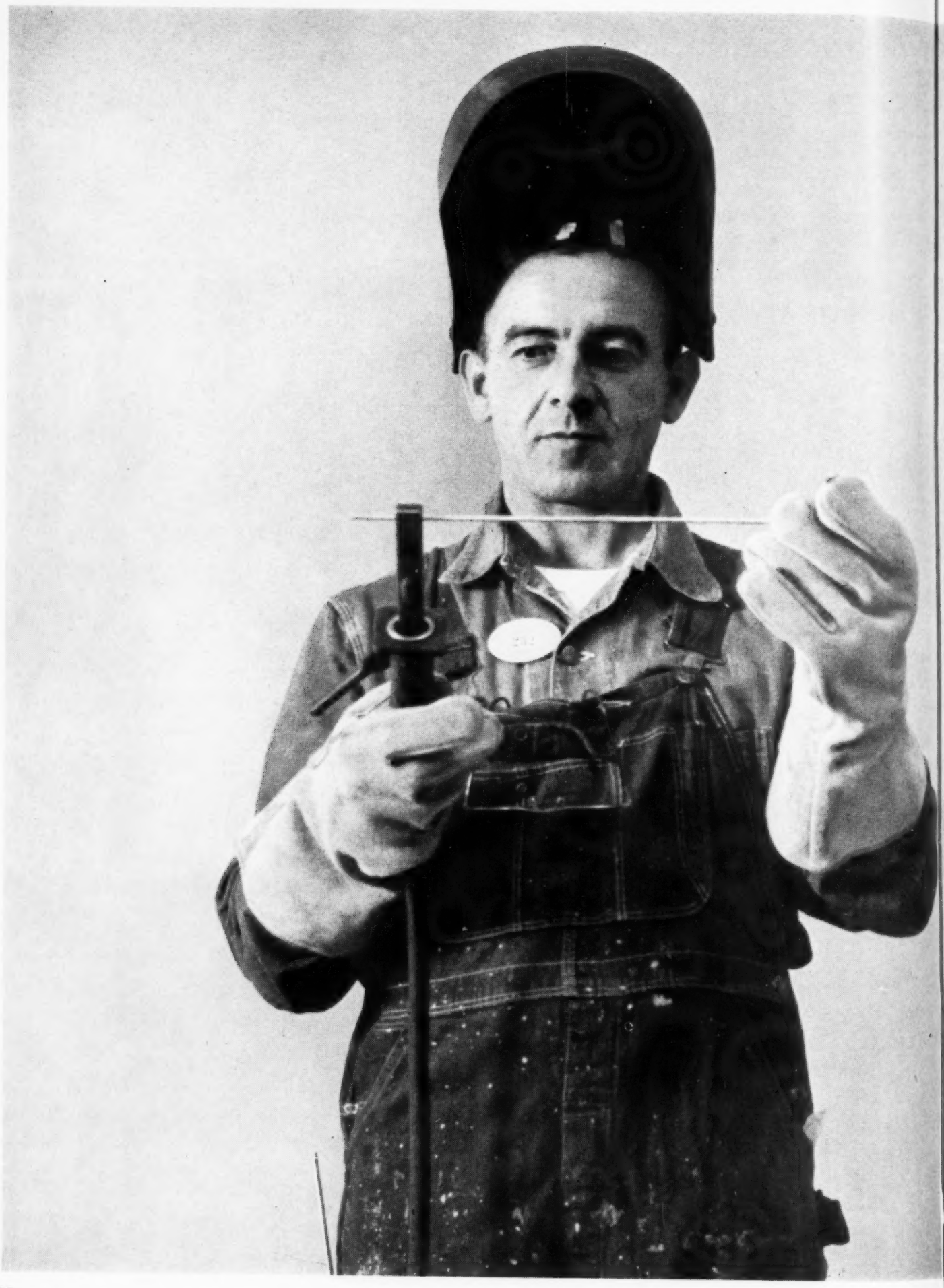

The Welder

With his electric arc he joins one piece of metal to another.

But in the larger sense he joins together communication highways that criss-cross a nation, for the metals he welds are used in telephone equipment . . . destined for Bell central offices all over the country.

Like the lineman and the operator, the welder lends his special skill and talents to help achieve the common goal of the telephone industry . . . providing better telephone service for America.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

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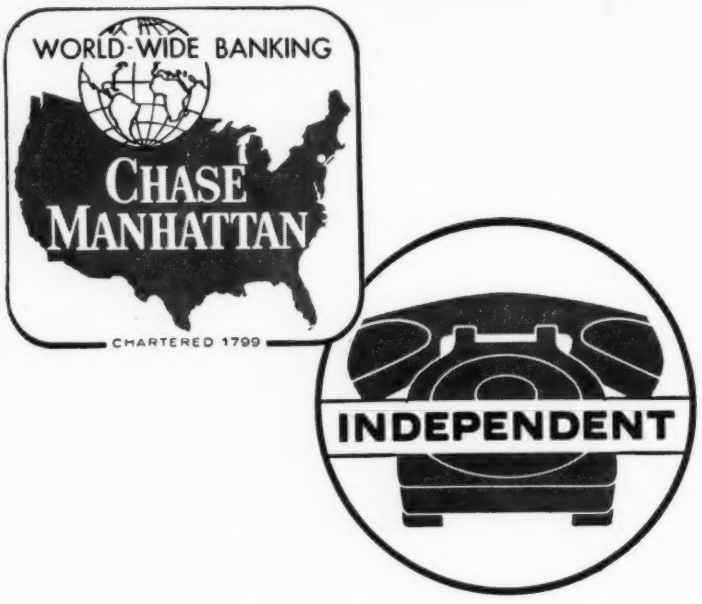

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The Chase Manhattan Bank has a special staff with many years of experience in providing the independent telephone industry with tailor-made banking service.

The bank has made many loans—small as well as large—aggregating many millions of dollars to the industry. Such loans are made to companies all over the country to provide for expansion of properties and the improvement of services. The bank has also assisted many companies in the solution of other corporate problems.

Chase Manhattan is proud of its contribution to the phenomenal growth of the independent telephone industry.

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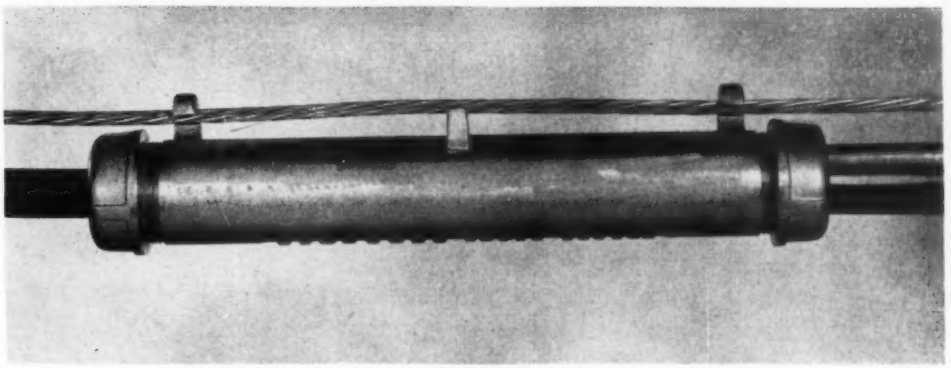
FOR LEAD, PLASTIC AND ALUMINUM CABLES

CAN BE USED 100% ON ALL NEW CABLE PLANT

NO WIPING
★
NO TRAINING
★
NO TIES OR STRAPS
★
CAN BE INSTALLED BY ONE MAN
★
REDUCES ACCIDENTS TIME AND COSTS $8.25 EACH
★

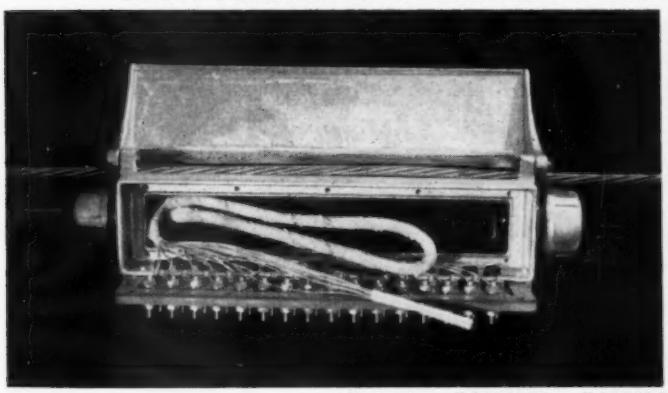


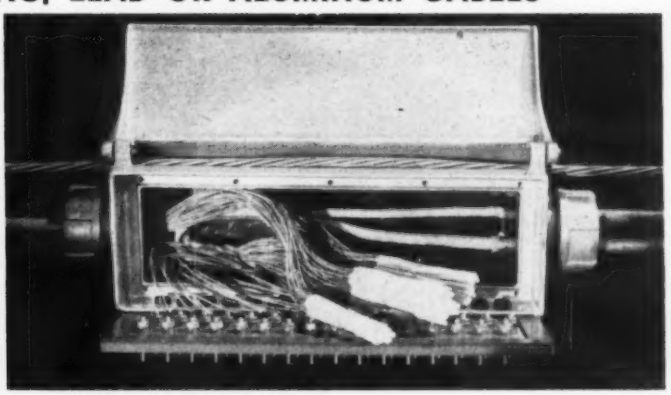
Pat. Pend.

S-4 TYPE SLEEVE, FOR ALL LEAD CABLES, 101 PR. AND LESS, 26-24-22 & 76 PR. 19 Ga.
S-4 TYPE SLEEVE, FOR ALL PLASTIC CABLES, 101 & LESS, 24-22 & 76 PR. 19 GA.
NEOPRENE GROMMETS 6 TO A BOX $3.25, BRANCHES $3.75

CHANNELL CABLE TERMINALS

BEST TERMINAL MADE FOR PLASTIC, LEAD OR ALUMINUM CABLES





Patents—#2318755—#2434102—#2683304—Others Pending

#C-3, 16 PAIR CHANNELL TERMINAL INSTALLED ON END OF CABLE. NOTE SLACK FOR FUTURE USE.

#C-4, 16 PAIR CHANNELL TERMINAL, BRANCH SPLICE, IT ELIMINATES 3 WAYS AT THESE POINTS.

NO SPLICING IS REQUIRED TO INSTALL CHANNELL TERMINALS ON STRAIGHT CABLE, CABLE IS PULLED THRU TERMINAL. SLACK IS LEFT AND THE WIRES ARE TERMINATED WITHOUT CUTTING.

CHANNELL CABLE TERMINALS

No. C-3
FOR THE FOLLOWING SIZE CABLES

26 GA.	24 GA.	22 GA.	19 GA.
11 PR.	11 PR.	11 PR.	11 PR.
16 PR.	16 PR.	16 PR.	16 PR.
26 PR.	26 PR.	26 PR.	26 PR.
51 PR.	51 PR.		

No. C-4
FOR THE FOLLOWING SIZE CABLES

26 GA.	24 GA.	22 GA.	19 GA.
26 PR.	26 PR.	26 PR.	26 PR.
51 PR.	51 PR.	51 PR.	51 PR.
76 PR.	76 PR.	76 PR.	
101 PR.	101 PR.	101 PR.	
152 PR.			
202 PR.			

PRICE LIST

6 PR. C-3 TERMINAL COMPLETE	$16.00
11 PR. C-3 TERMINAL COMPLETE	$18.00
16 PR. C-3 TERMINAL COMPLETE	$20.00
NEOPRENE GROMMETS*	$ 3.00

*6 to a box

11 PR. C-4 TERMINAL COMPLETE	$20.00
16 PR. C-4 TERMINAL COMPLETE	$22.00
26 PR. C-4 TERMINAL COMPLETE	$25.00
NEOPRENE GROMMETS*	$ 3.25

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All prices F.O.B. El Monte, California

NOTE:—IMPORTANT WHEN ORDERING TERMINALS OR SLEEVES

In order that we supply the right grommets, please specify the MAKE, SIZE, GAUGE and TYPE of cable they are to be used on. (Lead or Plastic). Write for information regarding lashing cable without lasher.

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- **Cross-arms au jus**

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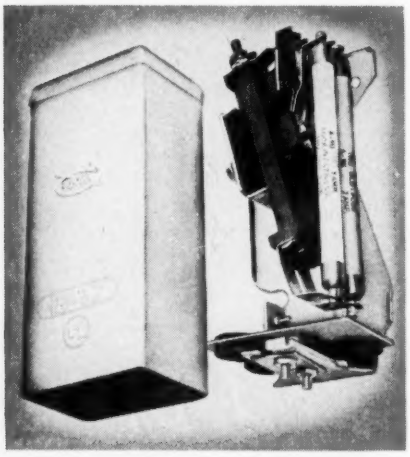
The Cook RO-9U sub-station protector

Protection plus—that's Cook Electric Company's type RO-9U sub-station protector.



The most highly protective sub-station protector available.

This rugged unit consists of a heavy Bakelite base, two 7-amp. ceramic fuses, two famous Tru-Gap dischargers and two secondary dischargers which will ground a fault current when the fuses blow. These are all mounted on a sturdy steel bracket and covered with a heavy gauge, weathertight, zinc hood.

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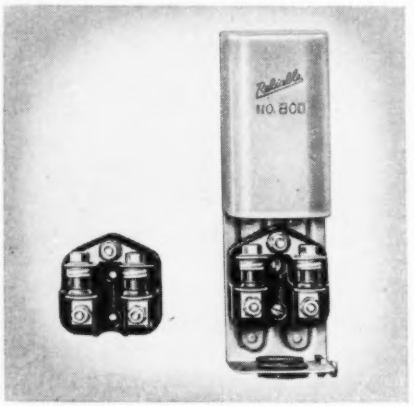
Shown here are two models of fuseless station protectors—both designed to guard your stations 24 hours a day, requiring no maintenance or attention at all.



No. 700 protector—for indoor use.
No. 800 protector—has weatherproof housing for outdoor installation.

The No. 700 is built for indoor use. You'll find its workable design combined with small size are just what you need.

No. 800 is weatherproofed for trouble-free outdoor mounting.

Both models are approved and listed by the Underwriters' Laboratories, Inc., for use where installations meet the requirements of the National Electrical Code (see Article 800). Each of them mounts two Reliable No. 504 self-contained, weatherproofed screw-in type protector units, which house carbon electrodes spaced approximately .0035" for air gap.

Manufactured by Reliable Electric Co. Your Stromberg-Carlson representative is ready to supply them to you.

Taper-less battery saves space

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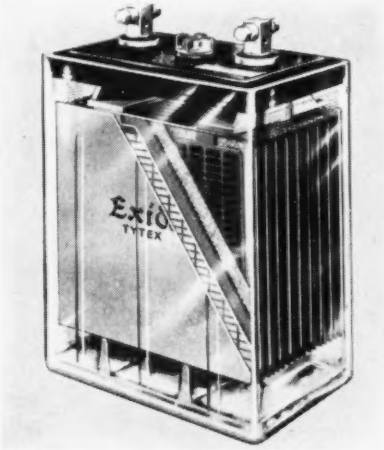
Among other features of the battery are the balanced positive and



Exide Tytex Battery has vertical sides.

negative plate design which, together with the use of Mipor separators and Vitrex retainers, contribute to long battery life, less weight per ampere hour output and more attractive looking cells which improve the appearance of the installations.

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There's extra revenue in Koiled Kords* retractile cords—the spring-like telephone cords that curl up neatly instead of dangling noose-like from the telephone.

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Available in black or color.

last indefinitely under severe service conditions. Extend to about 5 times their retracted length and return to their original neat coil when released.

Tinsel conductors provide maximum flexibility.

Neoprene outer jacket is smooth, clean, attractive, reduces cord trouble to a minimum.

Cannot fray and is unharmed by perspiration, humidity, oil, water, grease or acid.

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1955 Nation's Worst for Auto Deaths, Survey Shows

The nation's worst automobile accident toll in history was recorded in 1955. Traffic deaths totaled 37,800 last year compared with 35,500 in 1954. The injury count reached 2,158,000 compared with 1,960,000 in the previous year.

These figures are taken from "Fatal Fallacies," the 22nd in an annual series of traffic accident data booklets published by The Travelers Insurance Cos. Accident facts from every state in the nation are collected and analyzed for the booklet by Travelers statisticians.

Excessive speed was the most dangerous driving mistake again in 1955, killing 12,700. The 1954 total was 12,380 persons. The injury total resulting from excessive speed was 702,560, compared with 659,000 in 1954.

The pedestrian record was the only bright spot in the 1955 accident picture. It reflected improvement for the fifth consecutive year. Pedestrian casualties were reduced to 230,400, compared with 235,060 in 1954.

Drivers under 25 years of age were involved in more than 27 per cent of 1955's fatal accidents, a greater number than ever before, although they comprise only about 14 per cent of the total of all the nation's drivers. Fast reflexes are not enough to avert a serious accident involving a recklessly driven car traveling at an excessive rate of speed.

Weekend crashes accounted for 15,730 killed and 766,090 injured. The 1954 weekend record was 13,980 killed and 678,000 injured. The reasons for this record number of weekend highway fatalities lie in the motoring habits of the American public, comments the booklet. "Every highway in the nation has its Saturday share of that portion of America bound and determined to arrive at its weekend destination in time for dinner, even if the trip's last 60 miles must be covered in an hour flat. Too frequently the strain and fatigue of distance driving are ignored in anticipation of ample relaxation at the journey's end. Then, too, our highways continue to be filled with those drivers whose idea of relaxation is an extra drink or two 'for the road'."

Crossing between intersections, "jay walking" and stepping into the street from behind parked cars are the chief causes of pedestrian deaths and injuries.

The booklet also reveals that one out of every 75 persons in the United States became a traffic casualty in 1955.

Eighty-five per cent of the vehicles involved in accidents were passenger cars.

Twenty-two per cent of the deaths occurred on Saturdays.

Four to 8:00 p.m. are the most dangerous hours of the day.

The year 1955 reveals that traffic deaths and injuries are on the increase. There were 57 injuries to each death, compared with only 37 injuries per death in 1941.

BOOK REVIEW

"Electronic Engineering," by Samuel Seeley, professor and chairman, Department of Electrical Engineering, Syracuse University. 525 pages. Illus. Price $8.00.

Here is a detailed discussion of a large variety of electronic circuits which are important in such diverse fields as radar, television, electronic control and instrumentation, and computers.

The book begins with a general introduction to tubes and tube circuit principles, and then proceeds into a detailed consideration of the more important electron tube circuits. Emphasis is placed on the physical and mathematical analyses.

This book will help the reader develop a solid understanding of the techniques of analysis, the special features of the many circuits examined, and the means for combining circuits of different types in order to achieve required operational results.

Contents: Preface. Characteristics of Electron Tubes. Vacuum Triodes as Circuit Elements. Basic Amplifier Principles. Untuned Potential Amplifiers. Feedback in Amplifiers. Electronic Computing Circuits. Special Electronic Circuits. Oscillators. Heavily Biased Relaxation Circuits. Sawtooth Sweep Generators. Special Sweep Generators. Rectifiers. Rectifier Filters and Regulators. Electronic Instruments. Solid-state Theory. Transistors as Circuit Elements.

Appendix A: Notes on General Network Analysis. Appendix B: Plate Characteristics of Receiving-type Tubes. Index.

This book may be purchased through TELEPHONY.

Risk of Loss Ever-Present

"Whenever, in the capitalist system, the object is to make a profit, the prospect of a loss is ever-present. If banks or any other industries in a capitalist country are to serve without any risk at all, then they become government institutions." — GEORGE E. SOKOLSKY, *columnist.*

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PLOWING IN PLANT

Continued from page 21

methods and tools with accent on placing methods.

Our company (Indiana Bell Telephone Co.) has been concentrating on the Ferguson plow. This unit was first demonstrated to us in December, 1954. Since that time, in cooperation with the manufacturer, Massey-Harris-Ferguson organization of Detroit, Mich., we have done considerable work in developing this plow into an effective cable and wire-laying tool.

This unit consists of a Ferguson TO-35 tractor equipped with a subsoiler. This is a light weight tractor equipped with a special plow blade attached to a vertical beam coupled to the rear of the tractor through a mechanical linkage which is hydraulically operated (raising and lowering) from the tractor transmission.

The feature that attracted the application of this unit to telephone work was a tube attached to the rear of the plow beam for the purpose of laying flexible pipe for farm watering systems and placing farm electric wiring underground.

Our first Ferguson unit was purchased in April, 1955, and with some modifications in the cable and wire-laying tube, designed to increase its placing depth, this tool was put on field trial. The original unit would only place wire around 12 to 14 inches.

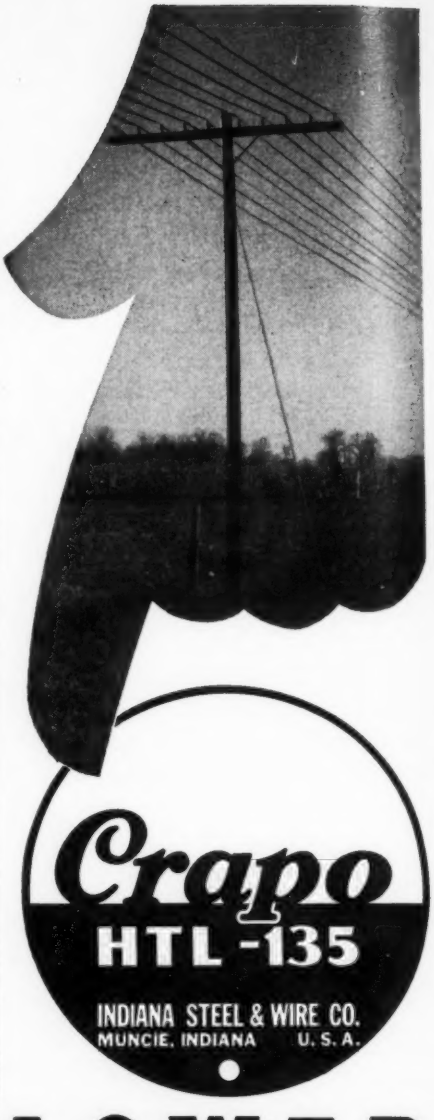
In order to facilitate greater traction under heavy pulls, such as plowing directly in gravel roads, the unit is equipped with bombardier tractor tracks, which function between the rear wheels and a set of idler wheels inserted between the rear and front wheels. Also, the rear wheels are equipped with weights (approximately 200 pounds), and the rear tires are filled with calcium chloride for added weight and traction.

Fig. 1 shows a rear view of the unit with the original modification of the plow and cable-laying tube. This initial modification increased the placing depth to 18 inches.

It was our considered opinion that an average placing depth of at least a minimum of 20 inches should be attained which prompted further changes and an increased depth of 2 inches (total, 22 inches).

The plow design is presently undergoing changes intended to increase its operating efficiency of the tractor and attain a placing depth of 24 inches, if possible.

Fig. 2 shows the plow share and cable placing tube as is currently being used. Note the side plate of the cable



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The rugged tensile strength of *Crapo* HTL-135 and its heavy galvanized coating provide dependable and economical service life on typical rural lines.

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Muncie, Indiana

placing tube is removable so as to facilitate removing cable or wire from tube when encountering an obstruction that would necessitate cutting cable or wire such as a bridge or concrete culvert. This feature saves unnecessary splices and has proven very satisfactory.

Fig. 3 shows the side plate removed. This is accomplished by removing four machine bolts.

When placing wire along a road where the ditch is not suitable for plowing, it is necessary to plow directly in the road. Due to the hard crust of the average gravel road, it is sometimes necessary to make a preliminary cut at about one-half depth before placing the wire.

Following the preliminary cut (see *Fig 4*), the wire is paid out along the cut and the plow traverses this preliminary cut picking up the wire, threading it through the plow as shown in *Fig. 5*, and depositing it into the ground as shown in *Fig. 6*. After the plowing operation is completed, the tractor or truck is run over the cut as a finishing operation. The normal crew and equipment required to carry out this operation is as follows:

Two Men
Ferguson Plow
Plow Trailer
Three-quarter Ton Truck

The plow trailer referred to is shown in *Fig. 7*, with the plow loaded for transporting. The plow is loaded by tilting the trailer platform to the ground and driving the plow aboard. This trailer has electrically operated brakes and is manufactured by Bolinger Brothers of Windfall, Ind. The truck used as part of this equipment is an International ¾-1 ton pick-up with dual wheels, four-speed transmission, heavy duty rear springs and auxiliary springs. This truck is also equipped with a special frame and chain hoist for handling reels of wire. We now have three of these units.

In moving the plow short distances, it is not necessary to employ the trailer. This is accomplished by uncoupling the top link bar, tilting the beam forward and securing it with the transport bar. With this arrangement, the plow share point clears the ground by 6 or 8 inches, thus allowing the unit to be moved along the highway directly.

This plow is capable of placing up to a 51-pair, 19-gauge cable. Thus far, we have placed some 150 miles of rural plant with this tool, 80 per cent of which has been "B" underground wire (one-pair, 16AWG rubber insulated, enclosed in flat steel wire armor and a neoprene jacket). All cable plowed in thus far has been (PIC) polyethylene insulated conductors.

Taking a good look at this idea of burying rural plant, it must be remembered that certain construction conditions must be met, such as road conditions, rock deposits and distribution problems if the maximum savings are to be realized. We are not completely satisfied with the tools and method presently used. However, the results indicate it is certainly a step in the right direction, since a considerable reduction in construction cost is evident.

Another important point, is a somewhat less accident potential, as compared with the hazards normally associated with placing and climbing poles. It is, therefore, fully expected that, with further development of the plow, improved operating techniques, together with continued development of low-cost terminals and associated materials, burying rural plant by direct plowing, will, for the most part, displace urban and rural aerial construction.

SUBSCRIBER CARRIER

Continued from page 30

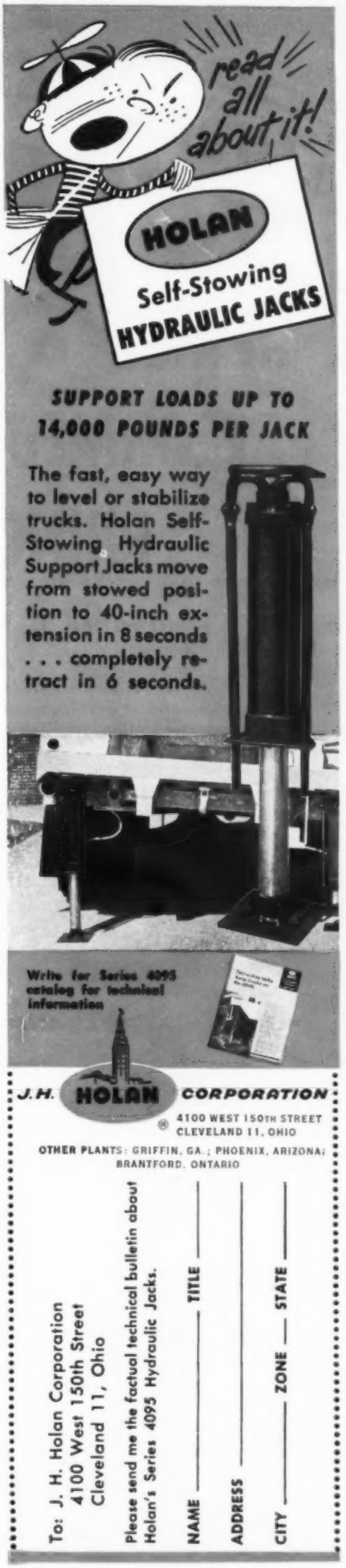
On this drawing the subscribers, applicants, and prospects can be grouped for line circuit assignments as it appears they will be at the end of the engineering period. From this grouping, it can be determined what facilities will be required initially to be compatible with the over-all fundamental plan, and what additional facilities will be required as each step in the fundamental plan develops.

The next step is to examine the several possible methods of provision, and to make cost comparisons to determine the most economical method. Cost comparisons should be made on the basis of annual charges which consist essentially of interest, depreciation, maintenance and taxes, and are usually expressed as a percentage of the initial costs.

It should be noted that the annual charges used throughout this paper are assumed values, and that in actual practice the values to be used are peculiar to a specific company and to a specific project.

As an illustration of a cost study, assume the small isolated community of *Fig. 1* with a requirement for three circuits. In this instance the applicants can be served by either three open wire circuits, two open wire circuits and one channel of subscriber line carrier, or by one open wire circuit and two channels of subscriber line carrier.

While it is theoretically possible to use three channels of subscriber line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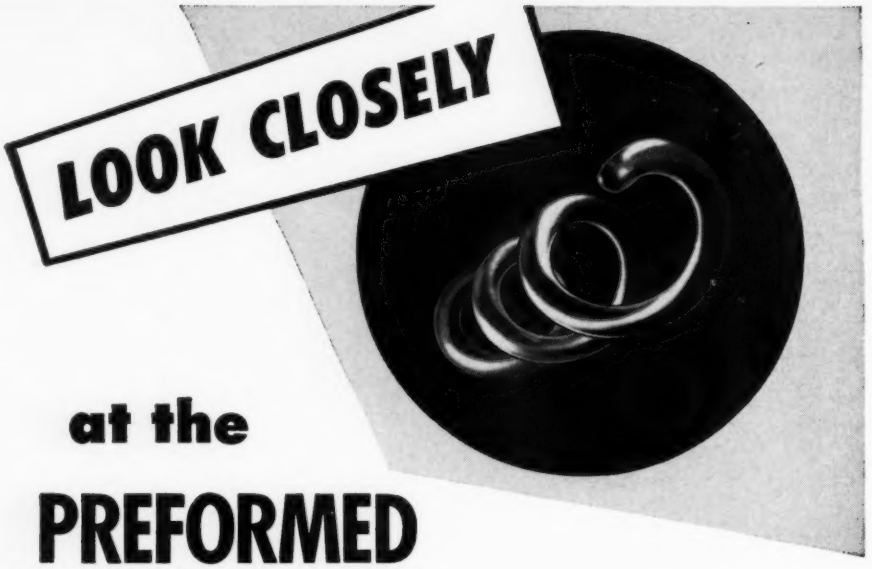

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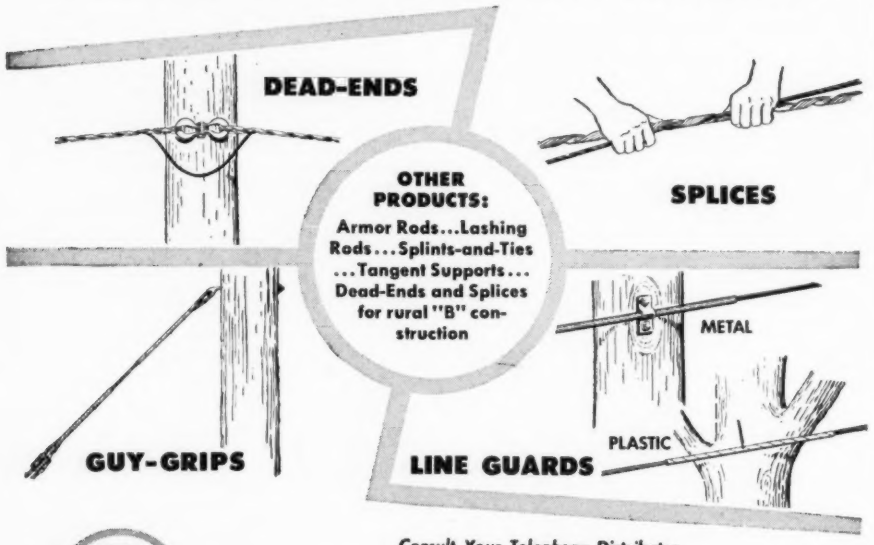

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carrier superimposed on a finer gauge wire than would be required for an open wire voice circuit, this option is not economically feasible due to the short distances involved and the use of long span construction. The first method of provision with annual charges developed is shown in *Fig. 2.*

Before costs can be developed for the methods utilizing channels of subscriber line carrier, it is necessary to decide which, if any, of the various makes of carriers is to be used. The selection will depend upon the type of ringing employed in the exchange, material costs, transmission characteristics, past experience, company standards, etc.

In the example being considered, assume type X subscriber line carrier has been selected, then *Figs. 3* and *4* show the remaining two methods of provision together with the applicable annual charges.

Examination of the annual charges developed in *Figs. 2, 3,* and *4* indicate that the most economical method of provision is the placing of one open wire circuit and two channels of subscriber line carrier per *Fig. 4.* Two pair in the local exchange cable have been conserved by the maximum use of subscriber line carrier equipment. The method of provision as shown in *Fig. 4* offers the further advantage of flexibility in the event of an unforeseen reduction in the number circuits required to the rural community. One or both channels of the carrier could be removed at a much higher salvage value and a much lower cost of removal than a corresponding removal of one or two physical circuits.

The preceding example is, of course, a much simpler application than is usually encountered in actual practice. Determination of the best method of provision can be quite complex, especially when applicants and subscribers are widely scattered.

In general, it is best to locate as many subscriber terminals in one location as possible so as to reduce the number of special protector layouts, weatherproof carrier terminal housings, accessory panels, and maintenance points. The power consumption of the subscriber terminals is small, so that in the case of operation from commercial ac power, the power bill will usually be the minimum.

Therefore, the concentration of these remote terminals will usually reduce the total power costs by reducing the number of minimum bills.

Figs. 5a and *5b* illustrate two different methods of serving the same 24 applicants with one physical circuit and two channels of subscriber line

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5. Uniprene Copper Bridle Wire, Tw. pr.
6. Gencaseal Interior Wire, Tw. pr., Brown
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8. Inside-Outside Station Wire, 2 Cond., Brown
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11. Ground Wire
12. Neotel Copperweld Drop Wire, Figure 8 (not shown)

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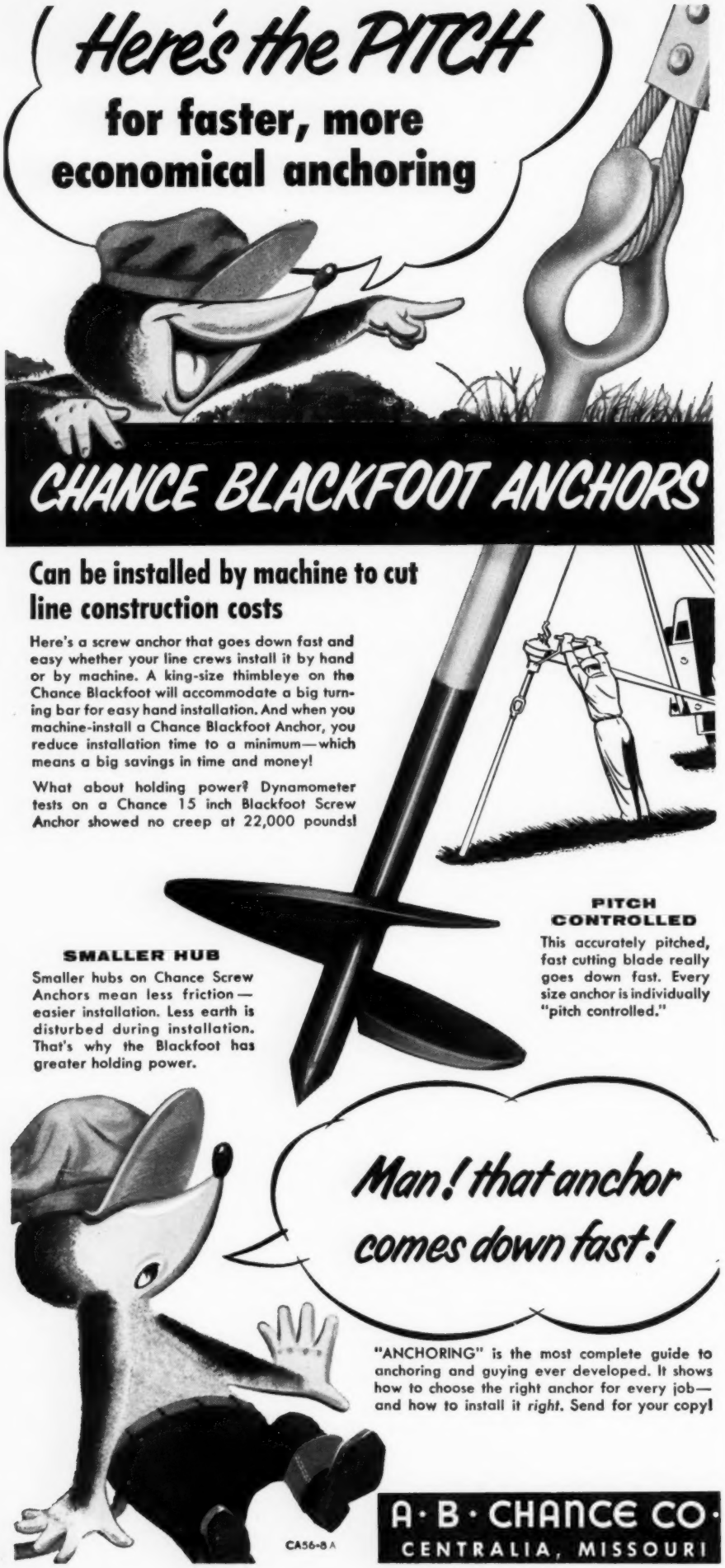
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carriers. *Fig. 5b* is the more economically attractive of the two layouts. It has one less remote terminal location, and, therefore, one less weatherproof housing, one less minimum power bill, and one less maintenance point. If voltage regulators and/or standby power supplies had been required in this instance, there would be one less of each of these.

Fig. 6 is a simplified layout of a proposed extension of service utilizing subscriber line carrier circuits. Service requirements are for two one-party business services to the commercial applicant at F, and eight-party rural service to 43 applicants in the same general area.

Due to the expediency of the request for the one-party business services, it was necessary to utilize material on hand to provide these facilities—namely, two 104 copper wire circuits from the cable terminal at A to the commercial applicant at F. Service to the rural applicants is to be provided as soon as additional material can be secured.

A cost study proved it would be most practical to provide the service to the rural applicants by means of six channels of subscriber line carriers. In interest of maximum service reliability, it was decided that the business services would remain on the physical circuits. Initial grouping of the subscribers indicated that one channel should be placed at B, and at C, one at E, one at F, and two at G.

However, since it was realized that costs could be reduced by decreasing the number of remote terminal locations, other layouts were considered. A series of cost studies proved that the locating of three channels at D and three at G was the preferred arrangement.

Because the attenuation of the cable between A and the central office exceeded the usable gain of the carrier, it was necessary to locate the central office terminals of the carrier in a pole mounted cabinet at the end cable terminal. Of course, this is not the preferred arrangement, but it was necessary in this case.

It is conceivable that the commercial applicant may desire foreign exchange service at some future date. The additional circuits required, if any, are to be provided by subscriber line carrier.

Future growth is also anticipated in the vicinity of C and G. Again it is planned to provide future facilities by the addition of channels to the two initial subscriber line carrier systems.

In the event of an unforeseen decrease in service requirements, up to

six channels of carrier can be removed economically and reused elsewhere.

The new lines on this project are to be transposed to an R-2 scheme and the two carrier systems will have staggered frequency allocations. In most applications, an R-1 or R-2 transposition scheme will meet transmission and cross-talk requirements.

However, the manufacturer's specifications and recommendations should be consulted before a final decision is made in this regard. Attenuation and cross-talk measurements should be made at carrier frequencies wherever possible, especially if it is planned to place more than two carrier systems on the same lead or in the same entrance cable.

The subscriber line carriers currently manufactured have a usable gain of at least 35 db, and practically all

Answers to Questions
On page 42

(1) The purpose of Aircraft Flash call service is to inform the military authorities of the movement of friendly and hostile planes.

(2) This service is accomplished throughout each Air Defense Control Area by the establishment of observation posts at selected points from which authorized civilian observers will report aircraft movement. Information from this source is reported by telephone to a Filter Center serving the area in which the observation posts are located, all calls being placed on a station basis.

(3) The area covered by each Filter Center is subdivided into one or more reporting areas, each designated by a reporting area name and represented at the Filter Center by a report receiving position. Each report receiving position is served at the TTC by means of either a regular subscriber's line or a specially designated direct line from the inward board, such as a toll terminal.

(4) When calling a Filter Center, the observation post observer will place a call by saying, "Aircraft Flash" followed by the calling telephone number. He will place his call with the first operator reached.

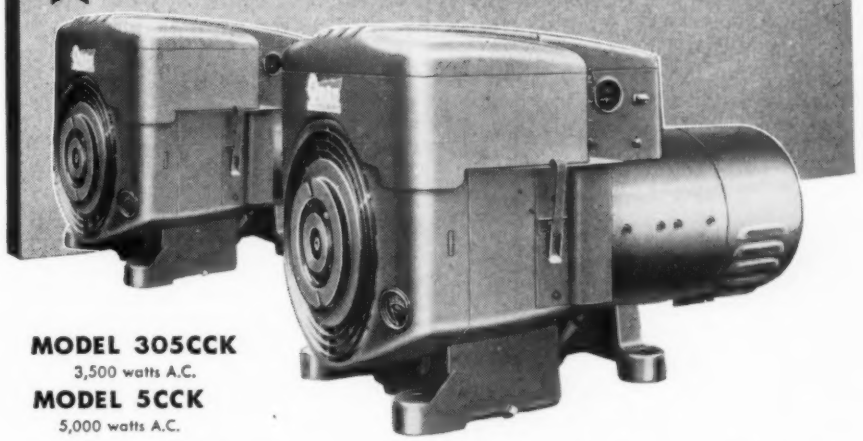
(5) The local operator will advance the call to the toll board unless she can establish the connection.

Wherever you need a 3½ or 5KW power package

New ONAN CCK Electric Plants

give you more of what you want most!

★ MORE OUTPUT PER POUND OF WEIGHT
★ MORE OUTPUT PER GALLON OF FUEL
★ MORE OUTPUT PER DOLLAR COST!



MODEL 305CCK
3,500 watts A.C.
MODEL 5CCK
5,000 watts A.C.

Powered by longer-life, short-stroke engines

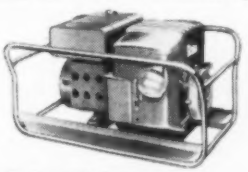
Onan has wrapped up all the time-tested Onan quality features with outstanding new design advances in these versatile power packages. Measure them by any standard . . . put them to work on any job . . . and you'll rate these new Onan units as leaders in value, way-ahead in performance.

More powerful, two-cylinder, air-cooled Onan engines of 4-cycle, horizontally-opposed, alternate-firing design, give smooth, quiet, effortless performance. Short stroke and moderate speed cut engine wear, give longer life. Quality features include rotating Stellite-faced exhaust valves, solid Stellite valve seat inserts and full pressure lubrication.

For difficult installations . . . in a closed compartment or "buried" within a vehicle, Onan's exclusive Vacu-Flo cooling system is available as an optional feature.

Like all Onan Portable Electric Plants, CCK units are completely Onan-built, with Onan engines direct-connected to Onan all-climate generators in compact, rugged units. Available in stationary, portable and standby models with a wide range of accessories giving them all-around versatility.

PORTABLE MODELS Equipped with carrying frame as shown or mounted on 2-wheel, rubber-tired dolly, the CCK makes a high-capacity, easily portable, package of electric power. Other Onan models: 500 to 50,000 watts.



Special folder describes 12 new CCK models. Write today.

Onan ELECTRIC PLANTS

D. W. ONAN & SONS INC.

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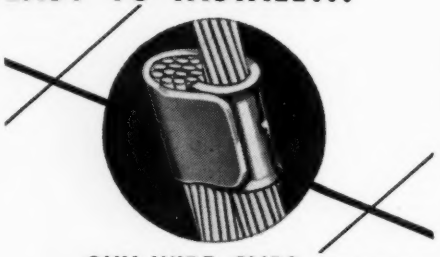
KEARNEY
Time-Savers

LAY-CIT CABLE GRIP for multi-conductor drop wire cables... non-slip double gripping action.

EASY TO INSTALL...

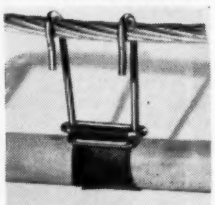


GUY WIRE CLIPS serve up strand ends neatly, quickly... with a single, simple squeeze.

SAVE MAINTENANCE...

HOUSE AND POLE HOOKS ... pull-proven for long-holding service ... hot-dip galvanized.

...FOR YEARS TO COME



CABLE HANGER... neoprene-impregnated glass-fibre strap cannot deteriorate ... holds secure without damaging insulation.

For Better Construction... Safer Maintenance

Specify

272

KEARNEY PRODUCTS

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signaling requirements can be provided —bridged, divided, superimposed, E and M and ringdown. A full line of special filters, accessory panels, weatherproof cabinets, impedance matching devices, emergency power supplies, and other accessories are also available.

The manufacturers have excellent publications available on request describing the application, installation and maintenance of their particular carriers, and it is recommended that anyone planning an installation of subscriber line carrier obtain these publications.

The E and M signaling and ringdown modifications of the subscriber line carrier should not be overlooked as they offer economies in providing extended area service trunks, foreign exchange trunks, special service circuits, and in some instances, short-haul toll trunks.

Although the subscriber line carrier is not the complete answer to the rural problem, it is definitely a step in that direction. Its flexibility, compatibility with other telephone plant, competitive initial and annual costs, good transmission and supervision characteristics, reliability and ease of maintenance all prove that the subscriber line carrier has a place in the telephone plant and its use should not be ignored.

GLOSSARY OF TELEPHONE ABBREVIATIONS

Continued from page 38

DICR	Daily installation completion report.
DIR	Directory.
DIRH	Directory hanger.
DIRS	Directory shelf.
DIRT	Directory table.
DIST	District.
DIST E	District engineer.
DISTR	Distributor.
DIV	Division.
DL	Dial.
DLL	Dial line.
DL SYS	Dial system.
DLY	Delay.
DM	District manager.
DN	Down.
DNP	Disconnect-non-payment of service.
DO	Delayed order.
DON	Delayed order notice.
DPH	Diaphram.
DPR	Dispatched repairman.
DR	Drive.
DRTN	Direct reading transmission measurement.
DSA	Dial service "A" board.
DSB	Distributor switch bank.
DSK	Disconnect key.
DS LTE	Dial service line terminal equipment.
DSO	Delayed service order.
DSOP	Dial service operation.
DSP	Dime slot plugged.
DT	Dial tester.
DTL	Daily trouble log.
DTMR	Daily time and material report.
DTO	Distributing toll operator.
DTRS	Daily trouble report summary.
DW	Defective workmanship.
DWCT	Defective wiring in cable terminal.
DWG	Drop wire grounded.
DWO	Drop wire open.
DWS	Drop wire short.
DWT	Dry weather test.
DXA	Double crossarm.

E

E	East
EA	Extended area.
EALS	Exchange area loading system.
EBF	Extension bell fails to ring.
EC	Earth current.
EFR	Emergency flashing relay.
EHP	Electrical hazard protection.
ELT	Electrolysis trouble.
EM	Exchange manager.
EMC	Emergency cable.
EMTR	Employe's trouble report.
EON	Equipment off normal.
EP	Ear piece.
EQV L	Equivalent length.
ER	Earth return.
ESO	East side of.
EST	Estimate.
ETR	Elapsed time report.
ETS	Elapsed time summary.
EX	Exchange.
EX TR	Exchange cable trouble report.
EX CTS	Exchange cable trouble summary.
EX LM	Exchange line mileage.
EX PTR	Exchange plant trouble report.
EXT	Extension.
EAS	Extended area service.

F

F	Flat.
FA	Fuse alarm.
FBA	Feed back amplifier.
FAC	Facilities.
FBY	False busy.
FBYT	False busy test.
FC	Find called or calling party.
FCC	Federal Communication Commission.
FD	Fast dial.
FDR	Feeder.
FE	Field engineer.
FELM	Foreign exchange line mileage.

XUM

FEMF	Foreign electromotive force.
FES	Foreign exchange service.
FHP	Fire hazard protection.
FLR	Floor.
FMB	Full money box.
FNT	Front.
FO	Fuse open.
FOK	Found okay.
FPL	Face plate leakage.
FPO	Feet per ohm.
FPR	First party release.
FPS	Four point switch.
FPTS	Full period talking service.
FRC	Final repairs completed.
FRMN	Frameman.
FRS	Flat rate service.
FS	First selector.
FSB	Finder switch bank.
FSPL	Full selective party line.
F SV	False supervision.
FWR	Field work required.

G

G	Guy
GA	Geographical area.
GC	Ground circuit.
GEN	Generator.
GI	Guy insulator.
GIL	General information letter.
GK	Ground key.
GL I	Glass insulator.
GN	Green.
GN BR	Green-brown.
GN SL	Green-slate.
GN WH	Green-white.
GO	General office.
GP	Ground post.
GPB	General plant bulletin.
GRD	Ground.
GRD/RTN	Ground return.
GRP	Group.
GSW	Galvanized steel wire.
GWN	Gets wrong number.

H

H	Hold.
HBT	Held by traffic.
HC	Heat coil.
HD	Hand telephone set, desk type.
HDT	Hall distributing terminal.
H CA	House cable.
HCG	Heat coil grounded.
HD R	Head receiver.
HDCW	Hard drawn copper wire.
HLA	Heavy loading area.
HFD	Hold for dispatching.
HFI	Hold for investigation.
HH	Hanging type handset.
HIDF	Horizontal intermediate distributing frame.
HK	Handset-key type.
HL	Hold line.
HLD	Holding.
HLR	Howler.
HMDF	Horizontal main distributing frame.
HNL	Humming noise on line.

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in Nationally
Known
Telephone Supplies

Lindsay's extensive warehousing operation means *immediate* shipment of most supplies . . . and our fast, efficient, *personalized* service guarantees satisfactory handling of every order from placement to delivery.

For reliability both in product and in service . . . "Look to Lindsay" . . . specialists in telephone supplies *only*. —Phone or write for immediate delivery or required data.

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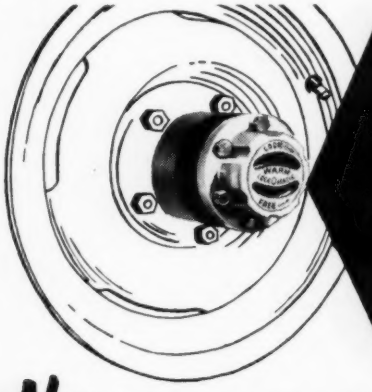
PRESSURE-TREATED POLES



NOW! HERE'S EVERYTHING in SELECTIVE DRIVE for 4-WHEEL DRIVES!

New WARN LOCKOMATIC HUBS

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- FREE-WHEELING 2-WHEEL DRIVE
- 4-WHEEL DRIVE FORWARD
- 4-WHEEL DRIVE REVERSE

LOCKING

- "SOLID" 4-WHEEL DRIVE FOR COMPRESSION BRAKING

MAKE 2 VEHICLES OUT OF 1

You know the advantages of 4-wheel drive. Now add drag-free, "free-wheeling" 2-wheel drive, and you have a vehicle just twice as useful—good for more trouble-free miles, and at a lot less cost for gas, tires and repairs! No gear whine or shimmy in 2-wheel drive, either—plus easier steering, plenty of pep and roadability. With Warn Hubs you can use your 4-wheel drive for *all* kinds of driving, on or off the highway. You have the drive you need *automatically* with Warn Lock-o-matics; through manual control with Warn Locking Hubs. Over 75,000 now in use around the world! Both models available for Willys, International, Dodge, Napco ½ to 1½ tons at authorized truck dealers. See your dealer today, or write:

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HOC	Handset off cradle.
HPF	High pass filter.
HR	High resistance.
HRG	High resistance ground.
HRS	High resistance short.
HRX	High resistance cross.
HS	Handset.
HS CD	Handset cord.
HSDT	High speed dial test.
HT	Holding time.
HTI	High tension interference.
HTS	Horizontal terminal strip.
HW	Hand telephone set, wall type.
HWY	Highway.

I

IAF	Installation activity file.
IC	Induction coil.
ICAL	Intermediate cable loading.
ICO	Induction coil open.
ICS	Induction coil short.
ICWX	Induction coil windings crossed.
ID	Information desk.
IDF	Intermediate distributing frame.
IDC	Inductive disturbance in cable.
IJ	Insulated joint.
IM	Interior move.
INC C	Incoming call.
INC T	Incoming trunk.
IND X	Inductive cross.
INF OP	Information operator.
IN O	Inward operator.
INS	Insulation.
INSP	Inspection.
ITC OP	Intercept operator.
INTC L AS	Intercommunicating line, automatic signaling.
INTC L PU	Intercommunicating line, pick up feature.
ITR	Initial trouble report.
IO	In order.
IR	Insulation resistance.
IT	Inside terminal.
IT OP	Inward toll operator.
IW	Inside wire.
IWC	Inside wire cable.
IWG	Inside wire grounded.
IWO	Inside wire open.
IWR	Inside wire removed.
IWS	Inside wire short.

J

J	Jack.
JA	Job assignment.
JB	Jack box.
JC	Joint construction.
JMP	Jumper.
JO	Job order.
JP	Jack panel.
JU	Joint user.
JNC B	Junction box.

K

K	Key.
KC	Key cabinet.
KE	Key equipment.

Maintenance. The time-tested, performance-proved 4-Wheel-Drive 'Jeep' Truck—with special service body—carries work crews, tools, equipment and supplies through soft fields, over rough country or up 60% grades—in good weather or bad—wherever they need to go to meet service emergencies or speed service installations.

'Jeep' vehicles GO where others can't to meet every service need!

Line service. The Universal 'Jeep', with the extra traction of its 4-wheel drive, goes where other vehicles can't go—up steep inclines, cross-country over the roughest terrain—to carry men and their equipment anywhere along the line.

Today, in nearly every phase of telephone industry service, from cable installation to line clearance, rugged 4-Wheel-Drive 'Jeep' vehicles work 'round-the-clock, in good weather or bad.

'Jeep' vehicles are the only 4-wheel drive vehicles in their weight class originally engineered completely for 4-wheel drive off-the-road use. They provide the "go-anywhere" ability to maintain uninterrupted customer service. They travel at top legal speeds on the highway in conventional 2-wheel drive. But, when storms or other emergencies threaten, the extra traction of their 4-wheel drive takes them over rough open country—through mud, sand or soft earth. And with power take-off, they supply mobile power to operate special equipment from trenches to winches, whether laying conduit or installing service lines.

Ask your Willys dealer for an on-the-job demonstration showing how versatile 4-Wheel-Drive 'Jeep' vehicles provide additional savings through long life, low maintenance costs and high resale value.

The 'Jeep'®

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WILLYS... makers of the world's most useful vehicles

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Telephone, Power, Lighting and Alarm Circuits . . .

RUN SIDE-BY-SIDE IN OCT-O-DUCT

In the same trench, Soapstone OCT-O-DUCT is carrying primary and secondary telephone, primary and secondary power, street lighting and fire alarm circuits for the new, $50 million industrial, commercial and residential Trousdale Development 17 miles south of San Francisco.

OCT-O-DUCT's flat sides, convenient length and diameters, and its outstanding electrical, chemical and mechanical characteristics make it the natural choice for complicated set-ups like this, where installation speed, economy and long life are essential.

To find out how OCT-O-DUCT can save *you* time . . . money . . . work, send for *Specification Bulletin 54-A*, and *Installation Manual 54-B*.

SOAPSTONE DUCT COMPANY

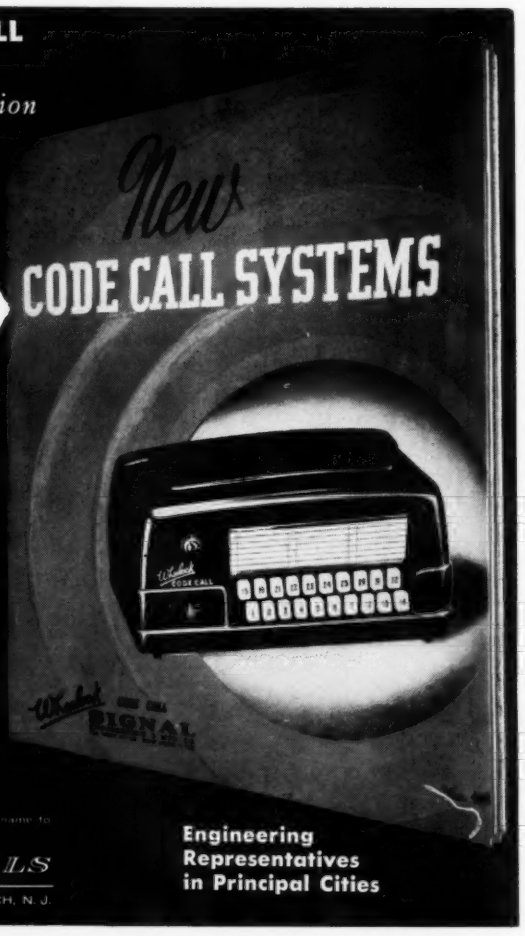
110 Linfield Drive, Menlo Park, California

WHEELOCK CODE CALL

for immediate communication

Descriptive Bulletin 4B-4 available on request. Write for your copy now to Wheelock Signals, Inc., Long Branch, New Jersey.

The busy switchboard operator just presses the button; a numerical code call sounds off throughout the building and the person being paged responds via the nearest telephone. The cycle is as simple as that. Also learn how easy it is to install a Wheelock Code Call System with any desired combination of chimes, bells, horns and other signalling devices.



Signal Engineering & Mfg. Co. has changed its name to

Wheelock SIGNALS INC.

CODE CALL LONG BRANCH, N. J.

Engineering Representatives in Principal Cities

KI	Key indicator.
KIE	Key indicator equipment.
KTE	Key telephone equipment.
KTS	Key telephone system.
KTU	Key telephone unit.

L

L	Locking.
L1	Line one.
L2	Line two.
LAR	Lightning arrester.
LB	Local battery.
LBT	Line ballistic test.
LBN	Lightning burn.
LBY	Line busy.
LCP	Line capacitance.
LCO	Line cuts out.
LD	Long distance.
LDC	Loading coil.
LDF	Line distributing frame.
LDP	Line drop.
LDSP	Loud speaker.
LDT	Long distance trunk.
LEQ	Line equipment.
LEQ A	Line equipment, automatic.
LF	Left telephone.
LF- BK	Line finder bank.
LFD	Line finder.
LG	Line group.
LGT	Lightning.
LIST	Listening.
LJ	Looping jack.
LK	Looking for party.
LKG	Locking.
LLA	Light loading area.
LLD	Line lamp dim.
LLE	Long line equipment.
LLF	Line link frame.
LLO	Line lamp open.
LLP	Line lamp.
LM	Loop mile.
LN	Lane.
LND	Line down.
LNM	Lineman.
LNYS	Line noisy.
LOC	Location.
LOT	Location of trouble.
LP	Loop.
LPT	Loop test.
LRB	Line ring bad.
LRG	Line ring good.
LRR	Line relay rack.
LS	Line switch.
LSC	Loose connection.
LSCU	Line signal control unit.
LSDT	Low speed dial test.
LSL	Losses in station loop.
LSP	Long span.
LT	Local traffic.
LTOK	Line test okay.
LTR	Line trouble.
LTB	Line tip bad.
LTG	Line tip good.
LV EI	Leave equipment in.
LW	Leave word.

The Toll Is Ghastly

In 1955, 37,800 Americans were killed in traffic accidents.

IN THE NATION'S CAPITAL

Concluded from page 18

federal taxes on gasoline and diesel fuel from two to three cents a gallon. Taxes on tires would be raised three cents a pound and taxes on trucks, buses, and trailers would be increased by 2 per cent. The plan is aimed at raising an additional 14.8 billion dollars over the next 16 years.

President Eisenhower asked Congress last year to approve a 25-billion-dollar interstate highway system financed by a special bond issue. Congress rejected the fund-raising scheme and Mr. Eisenhower dropped it this year in seeking approval of the 40,000-mile highway network.

The House bill would only authorize the proposed spending. Actual funds must be voted later in appropriations bills.

14 Iowans Form New Independent Company

A corporate charter has been granted to the Iowa Independent Telephone Co. This new corporation was brought about to assist the Independent telephone companies in Iowa that are desirous of modernizing their property but lack the necessary know-how and capital.

In forming this new company, the incorporators considered the changes that have taken place in the telephone industry during the postwar years. Dial service, toll dialing, carrier and microwave have created a need for a highly technical type of maintenance and specialized supervision not readily available to many small companies.

Taxes and legislation have created accounting problems. Recent increases in the minimum wage and the possibility of the industry losing the 750-

toll calls
TIMED TO THE SECOND
Automatically

This is the ultimate in modern, dependable and accurate computing of all toll calls TIMED TO THE SECOND. And what's more it's all done *automatically*—no need for operators to do it manually.

Just a flick of a lever, and Calculagraph computes, prints and records ELAPSED time of toll calls, thus eliminating human errors and allowing every operator to handle more calls—and more calls mean more dollars to you.

For time-saving operation, for dependable accuracy, for greater toll-call volume, install Calculagraphs on your switchboard. Investigate this model 33 shown here (others available according to need) and see for yourself what CALCULAGRAPH can do for you.
Don't delay, write today for catalog to Dept. T.

231 Photograph courtesy Lincoln (Neb.) Telephone and Telegraph Co. and Automatic Electric Sales Corp.

CALCULAGRAPH Company
HARRISON, N.J.
THE STANDARD OF ACCURACY SINCE 1892

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Murphy "ONE-MAN" Cable Tester

MODEL TTB

MODEL CMUW

ONE MAN WORKING ALONE

Can Now Identify Non-Working Cable Pairs 3 times faster than 2 men working together.

DISTANCE:
2 feet to 40 miles

The *Combination Tag-and-Terminating Board*, showing cable pairs properly connected. Tips — Horizontally. RINGS—Vertically.

The NEW MODEL CMUW
The new weatherproof gasket sealed case is now a part of every MODEL C shipped.

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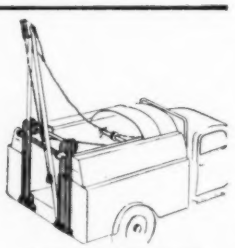
TEL-E-LECT STORAGE KIT

The patented Storage Kit fits any standard utility truck body and "A" frame derrick and it can be quickly bolted on the back of your truck by your local mechanic. The derrick will go up or down in a minute or less, entirely controlled by the man in the truck cab. Working with a double drum winch, you get live boom operation—or easily adjustable derrick elevation with a single drum winch. The cost is only a fraction of other, more intricate derrick storing systems—and there's no rebuilding of your present equipment! *Write for details.*

Earth Boring Equipment for All Types of Trucks

TEL-E-LECT *PRODUCTS, INC.*
10,007 Minnetonka Blvd., Minneapolis 26, Minn.
U.S. Patent No. 2,336,965.

Derrick raised by simply engaging the winch.



Vertical position—winch rotation reversed.

Derrick is locked in operating position.

station exemption for operators has brought new operating problems to many small companies. The operation of a successful telephone business that will meet the public demand for modern service has constantly become more complex, with each phase of the business becoming highly specialized, the incorporators point out.

The new company will provide supervision and the know-how, plus capital, to even the very smallest telephone company in Iowa that wishes to modernize or expand its telephone system.

Each of the 14 incorporators has had many years experience in the telephone industry and is presently operating telephone property.

The following is a list of the incorporators who are all from Iowa:

E. C. Carlson, manager, Creston Mutual Telephone Co.

A. C. Kelley, plant superintendent, Farmers Mutual Telephone Co., Clarinda.

Gene Daubendiek, president, Telephone Construction, Inc., Jefferson.

William C. Daubendiek, plant superintendent, Jefferson Telephone Co.

Earl G. Bellamy, manager, Bellamy Telephone Co., Knoxville.

James M. Bellamy, purchasing agent, Bellamy Telephone Co., Knoxville.

C. C. Pearce, manager, Farmers' Telephone Co. of Riceville.

Ross K. Vernon, manager, Mutual Telephone Co. of Sioux Center.

H. Filmore Melick, manager, West Liberty Telephone Co.

H. B. Melick, West Liberty Telephone Co.

A. L. Kelley, manager, Farmers Mutual Telephone Co., Clarinda.

Harold Thompson, manager, Clear Lake Independent Telephone Co.

J. L. Trevillion, manager, Lucas County Telephone Co., Chariton.

Clarence Henry, accountant, Creston Mutual Telephone Co.

The officers of this corporation are, A. C. Kelley, president; Gene Daubendiek, vice president, and Ross K. Vernon, secretary and treasurer.

The business address of the Iowa Independent Telephone Co. is 105 W. Harrison, Jefferson, Iowa (Box 267).

Guide for Founding Fathers

"No one, who studies the personal letters and the official papers of those formative years when Providence blessed our country with the most remarkable generation of statesmen ever to live in one land at the same time—no one who reads their words, can escape an awareness of their reliance upon divine goodness and the faith of these men in God."—LEWIS L. STRAUSS, *chairman, Atomic Energy Commission.*

Sets Up Fund to Advance The Teaching of Science

In recognition of the urgent need for increasing the effectiveness of teaching in the fields of science and mathematics in the secondary schools, General Dynamics Corp. has announced a constructive program for assistance to teachers in these particular fields.

In the Rochester, N. Y., area, General Dynamics has appropriated a $2,000 fund to be administered by its Stromberg-Carlson division. The Rochester fund will be used for the purpose of giving assistance to five outstanding science and mathematics teachers in the central western zone of New York state who wish to enroll in an approved summer educational program. Each grant will be for $400 to help defray expenses for those who qualify.

Each applicant must give assurance that the General Dynamics grant is the only financial assistance of this type being accepted by the applicant for the 1956 summer program. The teacher must also be under contract in a secondary school in this area for the academic year 1956-1957.

March Fire Losses in U.S. Top Figure for March, 1955

Estimated fire losses in the United States during March amounted to $89,315,000, the National Board of Fire Underwriters has reported.

According to Lewis A. Vincent, general manager, this $89,315,000 loss represents an increase of 1.3 per cent over losses of $88,197,000 reported for March 1955, and an increase of 6.3 per cent over losses of $84,041,000 for February 1956.

These estimated losses include an allowance for uninsured and unreported losses.

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It's C&D Calcium Batteries for EXTRA life

One of C&D's typical installations in use at the Delta Telephone and Telegraph Co., Courtland, Calif. The 24 PlastiCal (lead-calcium) cells, Type PCE-420, have a 420 A.H. capacity.

In the growing community of Courtland, California, the Delta Telephone and Telegraph Co. relies on the continuous, dependable service provided by C&D PlastiCal batteries. For here, in the historic Delta region, the Delta Telephone and Telegraph Co. has found that C&D has the answer to telephone battery needs.

When you order your next telephone battery, specify C&D. For with C&D, you get:

1. **One-piece, permanently-sealed plastic case. Entire unit is shock-resistant, lighter, and more compact than glass or rubber.**
2. **Exclusive suspended and supported plate construction eliminates leaks due to internal stresses.**
3. **Easier maintenance, because patented Post Seal eliminates acid creepage.**
4. **Lower shipping costs. Light plastic case reduces total in-place cost.**

You can order C&D batteries from your equipment supplier.

Write for bulletins!

For details and specifications on C&D telephone batteries, write for Bulletins T-527 and T-528.

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*KLEIN KUT PLIERS

for both regular and heavy-duty cutting

It was Klein that produced the first and still the finest regular side-cutting plier. Klein also gave the industry the modern, streamlined version so much in demand.

And it's Klein again with a new, high leverage cutting plier for light- or heavy-gauge wire, including No. 2 weatherproof hard drawn solid copper wire, and A.C.S.R.

There's no extra hinging of any kind—no uncomfortable wide-spread handles—with this new Klein-Kut Plier. The offset hinge permits the extra-high leverage and operation is as smooth and easy as with any other Klein Plier. Forged from high-grade tool steel, individually fitted, tempered, adjusted and tested. Ask for No. 213-9 N.E. for streamlined pattern.

Regular pattern available

Same high-leverage design, but in the original Klein side-cutting pattern. Ask for No. 213-9.

Write for free Copy of Bulletin 1054

*Trade Mark

ASK YOUR SUPPLIER

Foreign Distributor: International Standard Electric Corp., New York.

"Since 1857"

Mathias KLEIN & Sons

Established 1857 — Chicago, Ill., U.S.A.

7200 McCORMICK ROAD • CHICAGO 45 ILLINOIS

LaCroix Award to First General of NW Employe

Mrs. Rosemary Perry, a long distance operator for General Telephone Co. of the Northwest at Coeur d'Alene, Idaho, became that company's first employe to win the LaCroix award for meritorious service.

The LaCroix award, created in 1954 by the General Telephone System to recognize employes who perform outstanding service in line with their duties or above and beyond the call of duty, is in gold, silver, bronze or certificate form accompanied by a proportionate cash award.

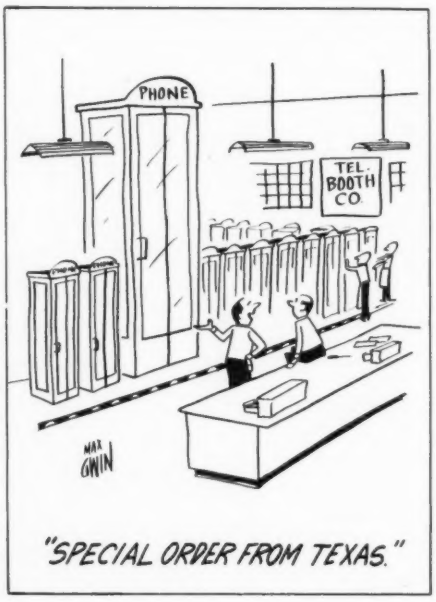
Mrs. Perry was presented with a certificate award and $25 at a banquet held on Apr. 13 by the company's Coeur d'Alene employes.

Mrs. Perry's resourcefulness one night last summer in tracing an unidentified emergency call was instrumental in saving the life of a Kellogg, Idaho man, and it was for this act that she was presented with the LaCroix certificate.

Mrs. Perry was runner-up in last year's Inland Empire Telephone Queen contest.

Robbing Peter to Pay Paul

"... It is commonplace to read political programs which propose tax reduction on the one hand and, on the other, all manner of increased federal expenditures for social security, for schools and roads, for public housing, for public power development, and so on. How could such programs be put into effect? In only one way—by running the government farther into debt through a series of huge deficits. Then renewed inflation would follow as day follows night, and the people would be "robbed" of their savings again. No



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EXTRA HOLDING POWER
QUICK INSTALLATION
TOUGH FOR LONG LIFE

EVERSTICK ANCHORS

The preferred anchor of engineers and crews alike for permanent construction and maintenance work. Complete line of sizes to meet every guying problem. Made of tough, rust resistant malleable iron.

Special nut housing locks anchor firmly on rod and prevents rod from slipping through anchor.

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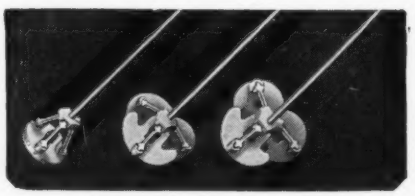


Everstick plates are so designed to expand easily and quickly into undisturbed earth. The wide coverage of expanded anchor assures great holding power in any kind of soil. Write for bulletin.

EVERSTICK ANCHOR CO.

FAIRFIELD, IOWA

other results could be expected from a policy of taxing less while spending more. And, along with the material losses, the individual would lose opportunity and freedom—a price always exacted by governments which are reckless with the assets of the people, and insatiable in their drive for more and more power over the lives of all." —INDUSTRIAL NEWS REVIEW.

Publishes Booklet on Employe Absenteeism

Occupational Health Institute, Inc., has issued a bulletin titled "Absenteeism."

The 12-page booklet poses the problem thus: "With employe absenteeism accounting for an estimated 10-billion-dollar annual loss to industry, the question arises as to who should be charged with the responsibility of its control." The rest of the booklet is devoted to further discussion of the problem and avenues for its solution.

Address of the Occupational Health Institute: 6 E. 39th St., New York 16, N. Y.

Bell to Spend $2,100,000,000 On Expansion, Improvements

American Telephone & Telegraph Co. it is reported, is the first company in American industrial history to lay out more than 2 billion dollars for expansion in one year.

AT&T, through its operating companies which comprise the Bell System, will spend about 2.1 billion dollars to expand and improve its service in 1956, Cleo F. Craig, president, told a record crowd of more than 3,000 share owners at the 71st annual meeting.

The Bell System spent 1.6 billion dollars on expansion in 1955.

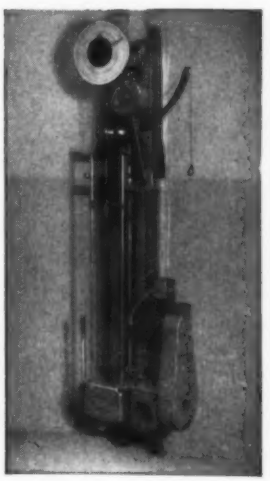
"As of now, the Bell System is serving about 47 million telephones," the AT&T chief executive said. "Barring unforeseen developments, we should be celebrating 50 million telephones in service next year."

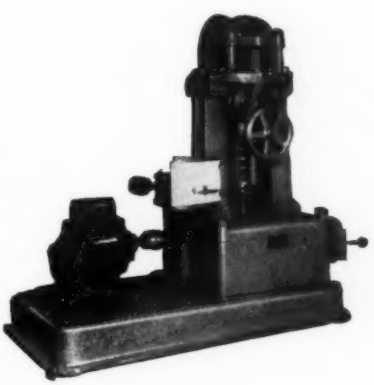
Long distance business shows a healthy growth, which has resulted as much from able promotions as from increase in number of telephones, Mr. Craig said.

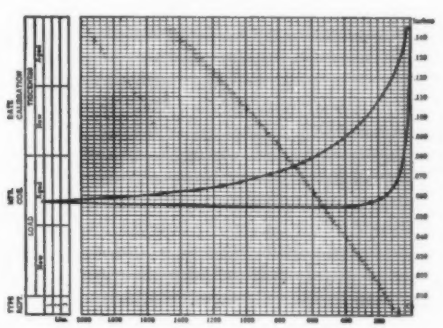
New Emphasis on Research

"The great advancements in the arts of generation and transmission of electricity are the result of continuing research work by the electric industry and by the manufacturers of equipment. As we stand now at the beginning of the atomic age, it is obvious that our research activities will have to be multiplied many times over."—HARLEE BRANCH JR., *president, Edison Electric Institute.*

With labor and maintenance costs much higher today than some years ago, it is natural for telephone companies to insist on installing drop wire that will give long service. Dependability in Lowell's complete line of Telephone Wires is assured by a technical staff using many physical tests to determine the effect of heat, aging, tensile strength, compression, cold, acids, oils, moisture and abrasion. Tensile test machine at right which tests for adhesion enables us to guarantee that the adhesion bond between the insulation and conductor is stronger than the conductor itself.







Compression testing is essential in high grade insulated telephone wires. All Lowell parallel neoprene jacketed drop wire is tested in our laboratory to withstand pressure of 2000 lbs. or more before the insulation jackets are crushed. Since resistance to compression determines the quality of the adhesion these tests prove that Lowell Drop Wire will stand the crushing action of the P Clamp without cracking of the insulation or jacket, thus insuring dependability and long life in service.

"Fine Wires Only"

LOWELL INSULATED WIRE COMPANY

171 LINCOLN STREET ··· LOWELL, MASSACHUSETTS

PANCAKE
is the
Modern Way
to carry
communications
wiring to the
point of use!

Pancake is the streamlined, modern method of making individual telephone connections to office desks or communication points in factories. The galvanized steel, *trip-proof* surface raceway can be quickly and economically installed with a *minimum* of interruption to office or factory routines.

Features added to the newly developed 1546T Telephone Outlet Box, *illustrated above*, provide (1) an ingress for 2600 Pancake, and (2) the "split bridge", which extends the versatility of this fitting, provides a more simple means for the installation of the 47B terminal block, and facilitates the use of the fitting for through wiring.

Specify 1500 Pancake for JKT Conductors; 2600 for telephone cable.

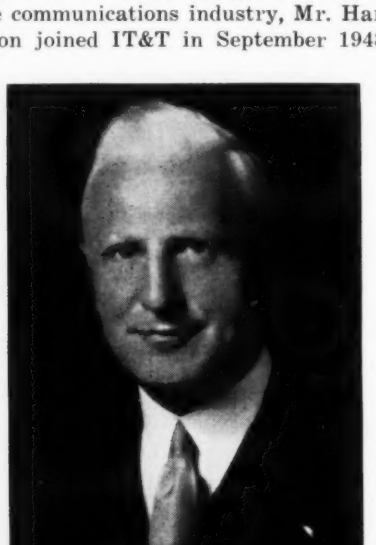
For further information write Dept. T-4

THE WIREMOLD COMPANY
HARTFORD 10, CONN.

Gen. William H. Harrison, IT&T President, Dies

William Henry Harrison, president of International Telephone & Telegraph Corp., died Apr. 21 of a heart ailment at his home in Garden City, Long Island, N. Y. He was 63 years of age.

One of the outstanding executives in the communications industry, Mr. Harrison joined IT&T in September 1948,



W. H. HARRISON

from the American Telephone & Telegraph Co. where he had been serving as vice president in charge of operations and engineering.

Born in Brooklyn, N. Y., in 1892, Mr. Harrison began his career in communications with the New York Telephone Co. in 1909. In 1914 he joined the Western Electric Co., where he served as an engineer until 1918.

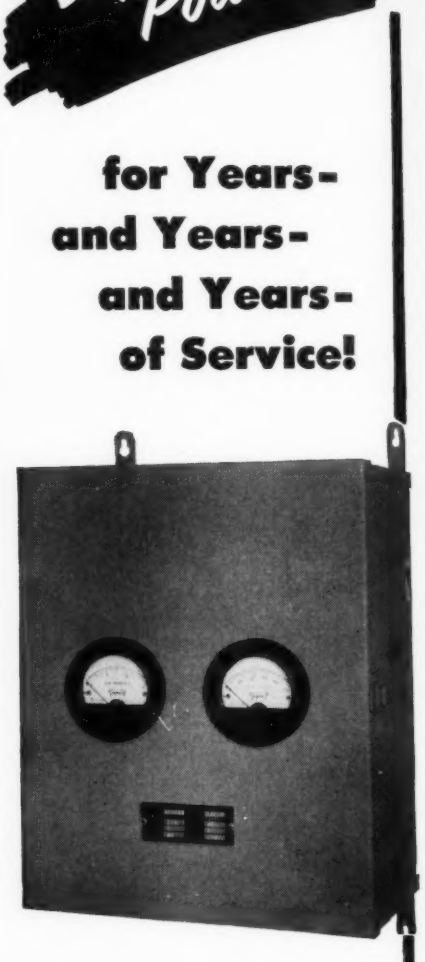
From 1918 to 1933, he served as an engineer and in administrative engineering posts with AT&T's Department of Operations and Engineering. In 1933, he was elected vice president in charge of operations of the Bell Telephone Co. of Pennsylvania and the Diamond State Telephone Co. He returned to the AT&T Department of Operations and Engineering as assistant vice president in 1937, and a year later was elected vice president.

In July 1940, Mr. Harrison was chosen by the late Gen. William A. Knudsen to head the construction division of the National Defense Advisory Commission. When General Knudsen became administrator of the Office of Production Management in January, 1941, he made Mr. Harrison chief of the Shipbuilding and Construction Branch.

In 1941, he became director of production in the Office of Production Management, the second highest post

Dependable Power

for Years-
and Years-
and Years-
of Service!



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BATTERY ELIMINATORS
BATTERY CHARGERS

In sizes and capacities to meet every telephone power requirement.

See your Schauer Jobber.
Write for Bulletin 1465.

RECTIFIER DIVISION
SCHAUER
MANUFACTURING CORP.

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in that agency. He also served as a member of the Joint Defense Production Committee of the United States and Canada.

In June, 1942, he was commissioned a colonel in the Army and, a short time later, was promoted to brigadier general, serving as Director of Procurement in the Services of Supply under Gen. Brehon Somervell. In this capacity, he was in charge of procurement of all manifold items and materials needed for the prosecution of the war and made several flights to military installations throughout the world.

With his elevation to the rank of major general in July, 1943, General Harrison took over the direction of the Signal Corps Procurement and Distribution Service, which obtained and distributed the entire communications-radio-electronics materiel of the Army and the Army Air Forces. Upon his return to civilian life, he was again elected vice president of AT&T in charge of operations and engineering.

In recognition of his wartime services, Mr. Harrison was awarded the Distinguished Service Medal by the War Department; the Most Excellent Order of the British Empire, with the degree of Honorary Commander; and the Cross of the French Legion of Honor, with the rank of Officer. He was also awarded the Hoover Medal, the highest engineering civilian award, for "distinguished public service."

In addition to his many directorships in the IT&T system, Mr. Harrison was also a member of the board of directors of the Intertype Corp. of Brooklyn, N. Y., and the Nassau Hospital, Mineola, Long Island. He also served on the board of governors of the New York Hospital.

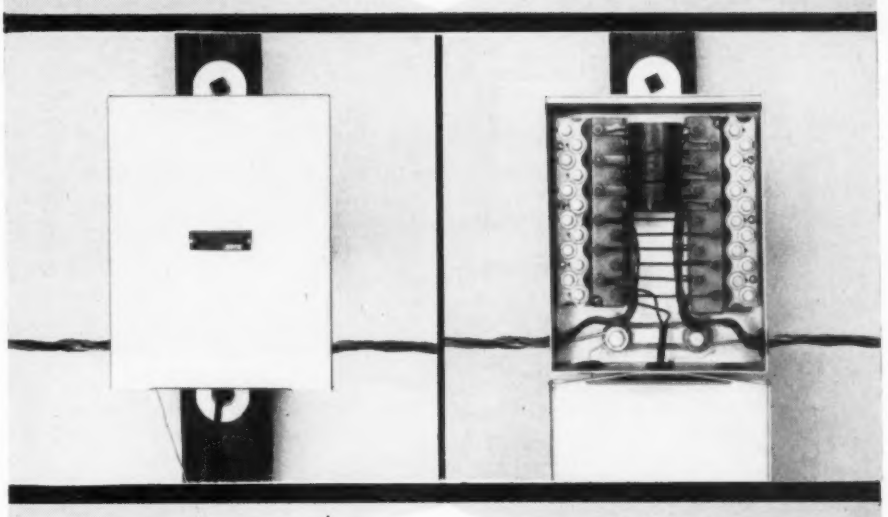
Mr. Harrison was past-president of the American Institute of Electrical Engineers. He was a member of the board of directors of the Brooklyn Polytechnic Institute; of the board of trustees of Pratt Institute and the United Engineering Trustees, Inc.; of the advisory council for science and engineering of Notre Dame University; of the advisory council to the department of electrical engineering of Princeton University; and of the honorary scientific societies, Eta Kappa Nu and Tau Beta Pi. He was granted honorary degrees by Brooklyn Polytechnic Institute, Notre Dame University, Rensselaer Polytechnic Institute and Manhattan College.

He is survived by his wife, the former Mabel Gilchrist Ouchterloney, and two sons, William Henry Jr. of Barrington, Ill., and Dr. J. Grant of Garden City, Long Island.

HERE IS OUR

TYPE 177

TERMINAL-LOADING CASE



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RURAL DISTRIBUTION CABLE

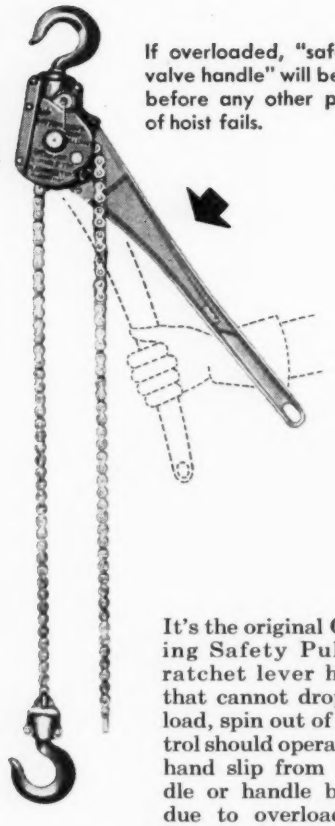
A cast aluminum combination terminal box and housing for loading coils. Designed to be used with the new rural distribution wire and available in 8 types to meet your requirements. Terminals are available with or without protectors and designed to accommodate loading coils of 88MH or 44MH inductance. Available through all telephone equipment suppliers.

COMMUNICATION EQUIPMENT & ENGINEERING CO.

5646 WEST RACE AVENUE CHICAGO 44, ILLINOIS

XUM

Here's the safest ratchet lever hoist ever invented!



If overloaded, "safety valve handle" will bend before any other part of hoist fails.

It's the original Coffing Safety Pull, a ratchet lever hoist that cannot drop its load, spin out of control should operator's hand slip from handle or handle break due to overloading. Dual pawls and ratchet keep load from slipping, safety stops prevent spinning; if overloaded, "safety valve handle" will bend before any other part of hoist fails.

The ¾-ton model (illustrated) weighs but 14 lbs. *Fifteen other models available handling up to 15 tons.* Ask your recognized distributor or write for bulletin SP, Coffing Hoist Division, 808 Walter St., Duff-Norton Company, Danville, Ill.

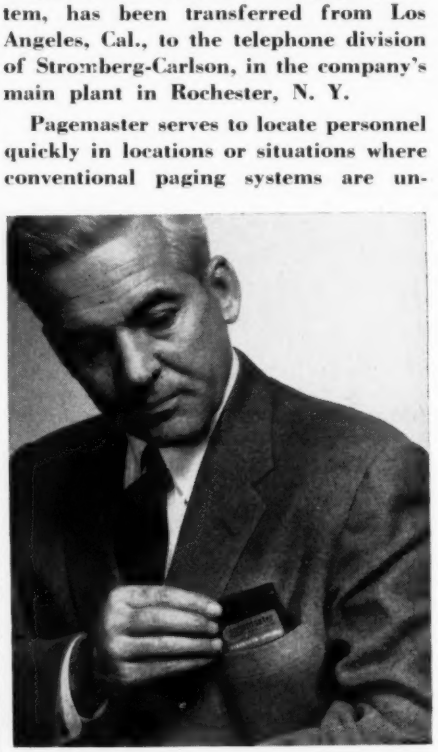
The exclusive, cadmium plated *Coffing Safety Hook* with spring actuated locking latch designed to shed, not snag, on wires or other objects is available for the ¾-ton, 1½-ton and 3-ton models at slightly additional cost.

Coffing Hoists

News on New Products

PAGING SYSTEM — Production of Pagemaster, a selective radio paging system, has been transferred from Los Angeles, Cal., to the telephone division of Stromberg-Carlson, in the company's main plant in Rochester, N. Y.

Pagemaster serves to locate personnel quickly in locations or situations where conventional paging systems are undesirable or ineffective. Principal feature of Pagemaster is a small radio decoder, about the size of a pack of cigarettes. Each such decoder in a Pagemaster system responds to a certain coded radio signal. When it receives that signal it emits a pleasant audible tone, which is a message to the individual carrying or using that particular decoder that he is being paged. He then goes to the nearest telephone and identifies himself to the operator to receive the message.



The Pagemaster decoder measures only 2½ inches x 3⅝ inches x 1 inch, and weighs only seven ounces. It has a colorful, smooth plastic case, and can easily be carried in a shirt or coat pocket. It is completely self-contained, with no external wires or other attachments. Power is supplied by a special compact power pack which can operate the decoder for several weeks.

In smaller industrial or institutional installations covering a limited area, the Pagemaster system provides up to 64 individual channels. In larger installations, where a Pagemaster system provides a paging service over a large metropolitan area, the system has up to about 4,000 channels.

The Pagemaster encoder transmitter is a small cabinet or console, on the front of which there are dials with which the coded signals are set up. This usually is placed at a telephone switchboard, and is operated by the telephone operator.

Only three or four seconds are required to set a coded signal into the transmitter. As many as four signals can be set up at once, and the transmitter automatically sequences them and continues to transmit each one until it is removed from the encoder by the operator, which she does simply by flipping a switch.

Principal installations of the smaller Pagemaster systems are expected to be in hospitals, factories, oil refineries and other applications where a conventional paging system is not wanted or is inadequate.

It is anticipated that the larger community-wide systems, serving metropoli-

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP512_____; NP513_____; NP514_____; NP515_____;
NP516_____; NP517_____; NP518_____; NP519_____;
NP520_____; NP521_____; NP522_____; NP523_____.

Name_____ Title_____

Company_____

Street_____

Town and State_____

4/28/56

tan areas, will be operated by the local telephone companies, and will serve in locating physicians, utility servicemen, municipal officials and others. Request NP512.

•

FIBER GLASS CROSSARMS AND POLES—An experimental installation of fiber glass poles and crossarms was recently shown to representatives and the trade press of the telephone and electric power industries.

Eleven poles were set up in February 1955 by Consumers Power Co., near Alma, Mich., in cooperation with Gar

Wood Industries, Inc., manufacturer of the poles, and with Line Material Co., the distributor. Highly satisfactory was the Consumers company's evaluation of the test installation.

Advantages claimed for the fiber glass poles—which have the trade name "Permaline"—are long life, great strength, light weight and insulating properties. Imperviousness to woodpecker assault, a valuable property in certain sections of the country, is another advantage.

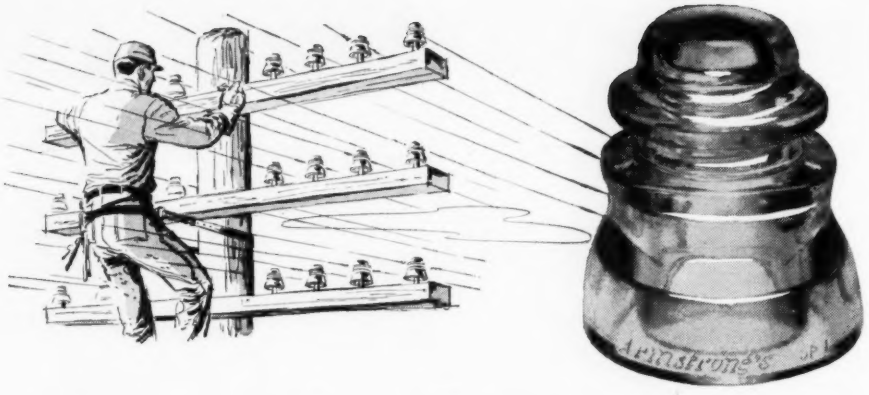
Poles steps above 8 feet are permanently installed, whereas the lower steps are inserted only when needed.

At present only cross-arms are in production; poles are to be turned out sometime this summer.

An 11-inch-diameter, 35-foot fiber glass pole weighs 150 pounds. Examples of the weights of class 5, 35-foot wood poles of equivalent strength are: Southern yellow pine, 862 pounds; western red cedar, 520 pounds, and Douglas fir, 770 pounds.

Fiber glass poles need not be treated since they are inherently resistant to atmospheric and ground corrosion.

many types
...many sizes
BUT ONE QUALITY ONLY
THE BEST!
A FIRST CLASS TOOL TO DO A FIRST CLASS JOB!
For over sixty years, American Beauty electric soldering irons have been setting the standard of performance by which all others are judged. With American Beauty there are no second or third grades.
The wide assortment includes more than twenty models. In wattages from 30 to 550 and tip diameters from one-eighth inch to one and one-eighth inches. Diamond or chisel point.
IN ADDITION TO OUR REGULAR TIPS, SPECIAL SHAPES AND SIZES ARE AVAILABLE IN VARIOUS SHANK DIAMETERS AND LENGTHS. LET US KNOW YOUR REQUIREMENTS.
AMERICAN ELECTRICAL HEATER CO.
Detroit 2, Michigan, U. S. A.
American Beauty
ELECTRIC SOLDERING IRONS
150-H



Practical Design

You'll find Armstrong Glass Insulators give long, trouble-free service. That's because wall section thickness and wire groove location are carefully calculated for maximum mechanical strength. Every detail that gives these insulators their practical design is the result of many years of experience—and this experience assures your satisfaction with Armstrong Glass Insulators. For details, write Armstrong Cork Co., Glass and Closure Div., 295 Fifth Ave., New York 16, N. Y.

Armstrong GLASS INSULATORS
for communications . . . for power

PICK **PORTER TOOLS**
for *SERVICE* and *SAFETY!...*

METAL CUTTING TOOLS

A tool for every telephone cutting job — bolts, rods, wire, wire rope, cable, hard and soft chain.

LINKFIX CHAIN REPAIR TOOLS

Tire Chain Link Repair Tools — for all cars and trucks.

PRUNING TOOLS

Telephone men prefer Porter Tree Trimmers, made in four different head types with solid or sectional poles, plus fast cutting pole saws. Try PORTER'S powerful FORESTER LOPPING SHEARS, with capacities up to 2" green wood, for line clearing and brush cutting.

Ask about HYDRAULIC CABLE CUTTERS and HYDRAULIC BUS BAR BENDER

PORTER COHARDITE INSULATED TOOLS

These famous tools serve two ways — for faster work — and safer work! Tough, durable insulation practically eliminates accidents. Wire Cutters factory-tested to 20,000 volts. Ask for Porter COHARDITE Tools — or write us for full information.

Available at your supply house or write direct for Catalog and Prices.

H. K. PORTER, INC. HKP ® Somerville 43, Mass.

The fiber glass pole's ability to take high impacts, heavy loads, and deflections without breaking, will be found advantageous, the Line Material Co. states. Where wood poles sometimes snap under sudden heavy load, a fiber glass pole will merely deflect. The pole has a hollow tubular cross section.

The company also points out that the poles' constant diameter has certain advantages. Pole length may be extended by the use of collars and plugs, plus a stub section.

Line Material says that, due to the low weight of the poles, lighter installation equipment may be employed, which, in mountainous terrain where poles have to be snaked in, would prove advantageous. For urban construction where mobile equipment cannot be used, two men can carry a fiber glass pole to the erection site.

In the accompanying illustration, the fiber glass crossarm (5-inch diameter and 8-foot length) on the pole at the left is secured by means of a metal gain and through-bolt; the arm on the pole at the right, by a metal gain with U-bolts. Another securing method is to pass the crossarm through a hole bored in the pole, then hold it in place by a through-bolt. Request NP 513.

•

PROTECTOR — In endeavoring to improve substation and pole cable terminal protection, engineers of Cook Electric Co. recently directed their efforts at two major objectives: First, to reduce maintenance costs occasioned by servicing of carbon discharges and secondly, to make possible the field repair of discharges by the replacement of damaged parts or components.

No. 41-450 Mytigap designed for Cook terminals.

The first objective has been solved by the use of discharge electrodes and ceramics similar to those used in automobile spark gap manufacture and also the development of a self-restoring device which automatically grounds and then clears the circuit after the load or

No. 41-474 Mytigap designed for interchangeability with other manufacturers' terminals.

potential is off the line, the company states.

The design of the new Mytigap also permits the field repair and reassembly of the discharger. It is determined, however, that the improved construction and operation of this gap will not necessitate such repair unless the gap is subjected to abnormal and sustained power cross discharges.

The new Cook Mytigap arrester for protection of telephone circuits from lightning and power potentials employs no carbon or organic material in its construction. Its discharge electrodes are an alloy of nickel, manganese and RU78. This is the same material used for the electrodes in automobile spark plugs and, states the company, it withstands the destructive effects of arcing and oxidation better than any other known material. The company states:

If we take the average life of a spark plug employed in an eight-cylinder engine as 10,000 miles, we find that the plug is required to fire 13,527,000 times, and this is in an atmosphere of vaporized hydrocarbons at a temperature of some 1800°F. and a pressure of 150 pounds per square inch. Such rugged, dependable service is possible only by the use of effective material for the discharge electrodes.

"By using this material for the arcing points, we eliminate the tendency to foul the gap as often happens when carbon electrodes are used. It is quite evident, therefore, that this material which exhibits such extreme resistance to the destructive effect of electric arcs is ideal for lightning arrester elements."

The internal structure of the Mytigap is so arranged that an arc of moderate duration will cause the electrodes to warp together, thus providing a continuous metallic path to ground and eliminating the arc.

These electrodes stay in contact as long as they are sufficiently hot, but when the disturbance ceases, they quickly return to their normal position,

BUCKEYE LEADS THE SUPPLY FIELD AGAIN!

NOW AVAILABLE

NEW OVAL TWIN CONSTRUCTION INSULATED

PARALLEL LINE WIRE

WITH COPPERWELD OR STEEL CONDUCTORS

ACTUAL SIZE

- CUT CONSTRUCTION COSTS TO MINIMUM
- SAVE ON VALUABLE INSTALLATION TIME
- USE FOR LONG-SPAN SERVICE LINE DROPS
- REPLACE OPEN WIRE RUN CONSTRUCTION

We Also Carry a Complete Line of Accessories for use with Parallel Line Wire

There has long been a recognized need for a wire of this type. A high strength construction with 2 parallel conductors encased in a highly weather-resistant black Polyethylene insulation. Gives greater and longer service than open wire with less time and effort required to install. Cuts costs to a minimum. Available in several types: PWC Ruraline #212 with 2 No. 12 AWG solid Copperweld conductors, PWC Ruraline #214 with 2 No. 14 AWG solid Copperweld conductors, and Superior PLW 083S with 2 conductors of .083 galvanized steel.

SEND FOR CIRCULAR 356

BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. COLUMBUS 21, OHIO

TAKE A BIG STEP TOWARD **SAFETY** WITH **DUO-SAFETY LADDERS**

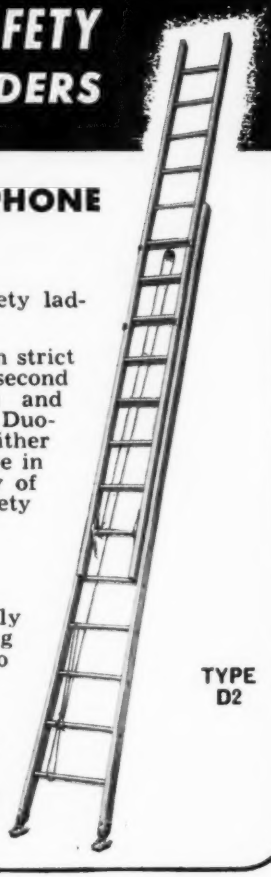
... CUSTOM DESIGNED FOR TELEPHONE MAINTENANCE WORK!

Here's one fine example of the many Duo-Safety ladders ideal for telephone maintenance work.

Type D — a truly great extension ladder built in strict accordance with safety regulations. Rungs are second growth hickory, reinforced with steel rods and equipped with special automatic locks and Duo-Safety's famous Safety Shoes. Made with either straight or parallel side rails, Type D is available in one, two or three sections — in a large variety of sizes. Write for free catalog on all Duo-Safety ladders.

IMMEDIATE DELIVERIES!

Duo-Safety ladders will be shipped immediately upon receipt of order! A planned stock-piling program assures really fast action — there's no delay the Duo-Safety way!



TYPE D2

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DUO-SAFETY LADDER CORP.
809 Ninth Street • Oshkosh, Wisconsin

For reliable service . . .

telephone men call on

"YANKEE"®

Push Drill No. 41

Slip in the drill point — and the famous "Yankee" chuck makes sure it stays! No slippage or pulling out of points when drill is in use.

Magazine handle holds eight drill points, 1/16" to 11/64". All exposed parts of Push Drill No. 41 are chrome plated.

No. 41

Write for free "Yankee" Tool Book.
"Yankee" Tools, 212 W. Lehigh Avenue, Philadelphia 33, Pennsylvania.

STANLEY

leaving the telephone line in its normal state.

The Mytigap is also arranged so that the interior parts are readily accessible and, therefore, any parts that become melted by extreme disturbances can be readily replaced. Request NP514.

•

BATTERIES—A new line of Exide-Manchex batteries has been introduced by Exide industrial division, The Electric Storage Battery Co.

The new batteries, in heat-resistant polystyrene jars, are designed for stationary power applications in utility, telephone, railway and industrial plant operations. They retain the basic Planté positive plate, a feature of all Exide-Manchex batteries.

Major improvements listed by the company are:

Increased battery life.

Higher instantaneous discharge rates.

Reduced maintenance because of less frequent additions of water.

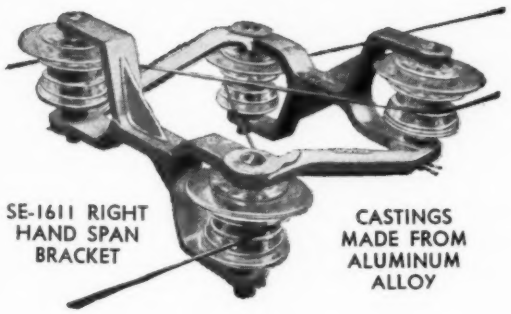
More effective sealing, and easier cleaning.

Ready adaptability to cycle as well as float service.

Insulation or spacing between plates of opposite polarity consists of molded one-piece polystyrene dowels and microporous rubber separators. The dowels accomplish perfect alignment between plates and greater access of electrolyte to the Manchex positive plates, resulting in better electrical characteristics, the company states.

The new design jars and covers are made of light-weight, heat resistant and shock absorbing polystyrene. The jars

IN CASE* YOU ~~WANT~~ Get A REAL MONEY SAVER



Especially adapted for carrier circuit construction

YOU GET ECONOMY

CASE* span brackets help you save on the number of poles in new line construction and in reconstruction; long spans are possible.

YOU GET QUALITY

Fabricated from lightest of all structural metals; equipped with Hemingray glass insulators; eliminate cross talk; easy to install.

RC-1 rubber insulators for use in areas where breakage of glass insulators is known to be prevalent.

Type 1088 Hemingray glass insulators complete with rubber bushings.

SOLD BY LEADING DISTRIBUTORS IN THE UNITED STATES

Also available
CASE ALUMINUM TRANSPOSITION POINT BRACKETS

TRANSANDEAN ASSOCIATES, Inc.
P.O. BOX 214, ORANGE, N. J.
Consulting Engineers and Constructors

Oh Hum feeling bum

Sure – it's Spring Fever

—

and
work is piling up—
and
not enuf folks to do it

—

Quit worrying—

—

If you need help—grab
that 'phone and call
Hudson 8-0611
Columbus, Ohio

—

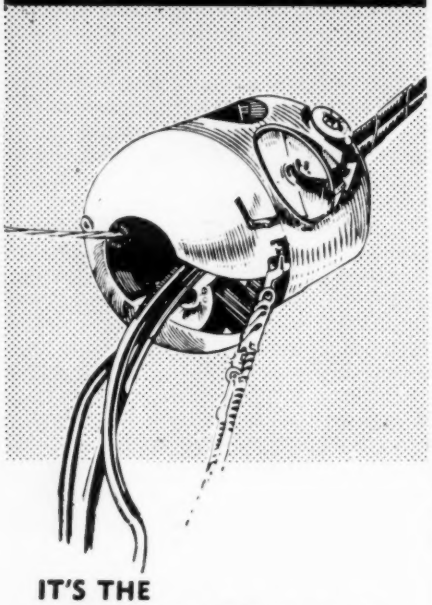
GUSTAV HIRSCH ORGANIZATION, INC.
1347 WEST 5th AVENUE
COLUMBUS, OHIO

—

Always at your service!

XUM

THREE TO ONE



IT'S THE
NEALE MODEL "K"
Only the
Model "K" Spinner
PLACES & SPINS
THREE SINGLE CABLES
Into
ONE COMPACT UNIT

ALSO SPINS SINGLE CABLE PERFECTLY

WRITE FOR LITERATURE AND PRICES

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Pirelli of Great Britain

are designed so as to provide increased volume of electrolyte.

Additional electrolyte reduces the need for water addition to replace evaporation. A method for suspending the elements in the larger size jars is accomplished by support ledges molded into the jar walls.

Covers are sealed to the jars and terminal posts to keep out dirt and prevent leakage of electrolyte.

The large electrolyte reservoir at the bottom of the jar provides ample space between the bottom of the plates and the jar to accommodate the full amount of sediment whether it be in float or cycle service.

An exclusive feature of this battery is the Planté positive plate consisting of a cast lead antimony grid into which rosettes or buttons of pure lead are permanently locked and then coated electro-chemically with the active material (lead peroxide). The battery gives long life because the active material cannot wash out and because the buttons give a constant supply of solid lead for conversion into active material, according to the company. Request NP515.

•

POWER DERRICKS—A new series of live-boom power derricks—including units with exclusive hydraulic sleeve locks for the side legs—has been introduced by J. H. Holan Corp. The derricks, identified as Series 5700, have a maximum load capacity of 6,000 pounds.

The derrick is raised and lowered by means of a powerful, double-acting cylinder. By moving a hydraulic control lever, the operator moves a derrick from its overhead storage position to within five and a half feet of the ground, where it is easy to thread the winch. Trussed bracing provides the rigidity needed for derrick operating capacity.

The series has two models—the 5700 LM for lifting poles up to 45 feet long and the taller 5700 HM for lifting poles up to 55 feet.

Series 5700 derricks are available with two types of locking for the side legs — pin-type and hydraulic-sleeve-lock-type. With the exclusive hydraulic sleeve lock, the operator raises the derrick to the vertical position by moving a hydraulic control lever, then locks the leg rigidly with the sleeve lock by moving another hydraulic control lever.

A safety stop pin makes it impossible for the sleeve to become accidentally disengaged.

Sleeve locking gives the obvious advantage of fast derrick locking and eliminates the possibility of anyone pulling a pin that could drop the derrick.

For those who prefer pin-type locking, the Series 5700 is available with a set of pins for each side leg. Pins are arranged so they are inserted in an established sequence.

A relief valve in the hydraulic system provides built-in safety. Fixed flow restriction prevents rapid fall.

The cable guide sheave for the winch line is attached to a trussed sheave bar and hinged so it swings out of the way when not in use.

The derrick itself is about 85 inches above the body floor when in storage position. When a digger is used, it is stored in a saddle between the side legs.

Hydraulic controls are located on the rear body panel. A feature of the derrick is that it provides live-boom action with a single-drum winch. Request NP516.

•

TRUCK LOCKING HUBS — The owner of a four-wheel drive vehicle will use it oftener—for more different purposes—and will spend less on gas and repairs, if it is equipped with the new Warn Lock-o-Matic Hub, according to the manufacturer, Warn Mfg. Co.

At the same time, maximum safety is assured by the fact that Lock-o-Matic Hubs can be locked to obtain "solid" four-wheel drive, with full engine braking power for ice or hills.

Truco SAFETY hydraulic cable reel carrier

is engineered for safe ONE MAN loading in 6 to 8 Minutes

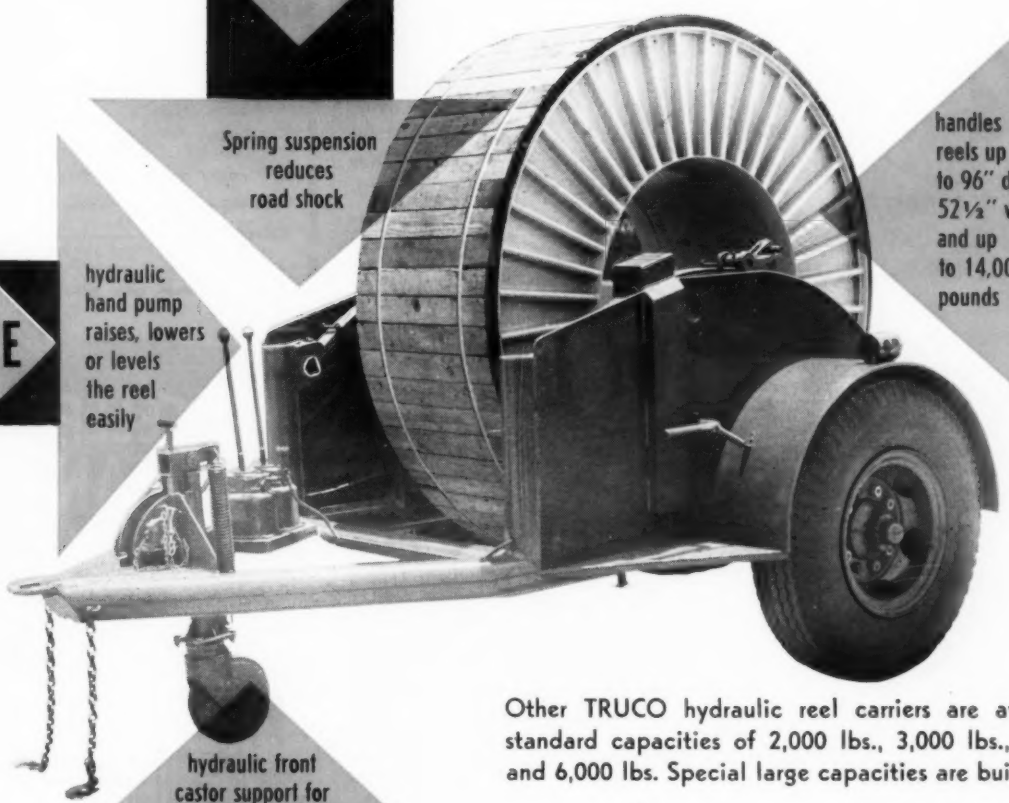
SAFE

SAFE

SAFE

SAFE

SAFE



Spring suspension reduces road shock

hydraulic hand pump raises, lowers or levels the reel easily

handles reels up to 96" diam. 52½" wide and up to 14,000 pounds

hydraulic front castor support for easy adjustment to height of pintle hook

Other TRUCO hydraulic reel carriers are available in standard capacities of 2,000 lbs., 3,000 lbs., 4,000 lbs. and 6,000 lbs. Special large capacities are built on order.

Write for detailed brochure, specifications and current prices. Find out how safe and fast cable loading can be —

Truco

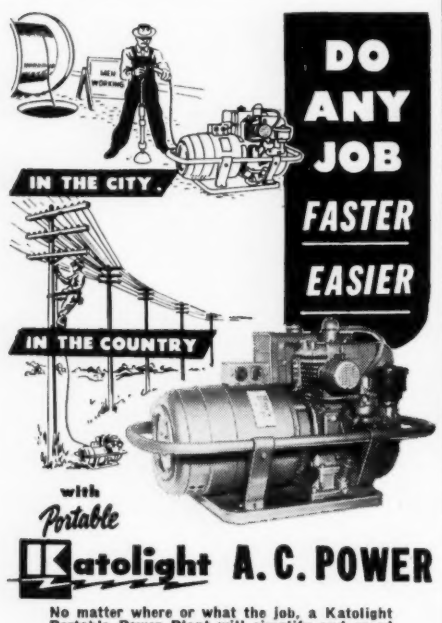
TRUCK Equipment COMPANY

3963 Walnut Street • Denver 5, Colorado

Manufacturers of Truco Self-Powered Diggers and Truco Safety Hydraulic Derricks

XUM

Don't Drop that Screw!
Hold it with an H.J.J. Screw-holding Driver
MADE IN A WIDE VARIETY OF SIZES
The H.J.J. COMPANY
268 Marlow Drive
OAKLAND 5, CALIF.


DO ANY JOB FASTER EASIER
IN THE CITY
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with Portable
Katolight A.C. POWER
No matter where or what the job, a Katolight Portable Power Plant will simplify and speed up construction or maintenance work by supplying quick dependable electrical power right on the spot. Operates blowers, heaters, drills, hammers, saws, soldering irons, other portable electrical tools and equipment. Eliminates power line hookups.
Gasoline models from 350 Watts to 50 K.W. D.C. models 500 watts through 15 K.W. in standard voltages. Emergency and Continuous Duty Power Plants in any size to 500 KVA.
IT'S NEW! SEND FOR FREE FOLDER ON NEW LIGHTWEIGHT PORTABLE MODELS
Katolight CORPORATION
Box 891-12, Mankato, Minnesota

The Lock-o-Matic combines the advantages of all previous Warn hubs, used on 75,000 vehicles around the world. "Free" position transforms the four-wheel drive into a vehicle that handles like a passenger car most of the time, but automatically engages in four-wheel drive as load or road conditions require.

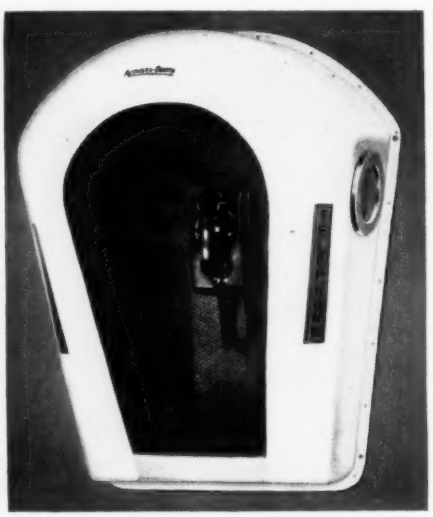
The automatic change takes place in any gear, forward or reverse. The front wheels turn freely, and the front drive train stands still, whenever power is not applied at the front end, with the result that tires and gears last longer, less gas is consumed, and the vehicle has snappier performance on the highway.

Warn locking hubs offer similar advantages through all-manual control. Both hub models are made for Willys, Dodge, International and Napco four-wheel drives from ½ to 1½ tons. Request NP517.

•

BOOTH—A device to prevent telephone conversations from being overwhelmed by the roar of industrial plants and noisy public buildings has been designed by Detroit Macoid Corp.

Named the "Acousta-Booth," it has a 44-inch high opening for the head



and shoulders of the person talking on the phone. The 26-pound booth attaches to the wall.

Company officials say research tests have demonstrated that inside the Acousta-Booth the din of a factory is knocked down to nearly the level of the murmur in an average business office.

Other possible users besides plants for the walk-in booth include bus and train stations, airports, department stores, garages, bowling alleys and athletic stadiums. Request NP518.

•

TRANSISTOR OSCILLATOR — A small self-contained battery powered

FITCHBURG ENGINEERING CORPORATION
Fitchburg, Mass., Dept. T-46
Send your free booklet on cutting costs.
*Name*_____
*Company*_____
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MR. TELEPHONE MAN!
WITH THIS NEW POWERFUL MARKWELL TELEPHONE TACKER
YOU CAN STAPLE ALL YOUR J-K WIRE AND CABLE UP TO 16 STRANDS.

SAVE OVER 50% IN MATERIAL AND LABOR.
MARKWELL Free Service!

Parts and labor no charge. Return postage paid to those buying MARKWELL Staples from us.
OTHER USES—Stapling Drop Wire, Metal Numerals, Signs, Screens, Building Repairs and Maintenance, Etc.

STAPLES PER PKG.—5,000

SIZE	8 per pkg.	15 per pkg.	30 per pkg.
L3B 5/16"	2.75	2.50	2.25
L3M 7/16"	2.90	2.75	2.50
L3D 9/16"	3.10	2.95	2.75

Sizes may be assorted for quantity price.
Further Discounts in Quantity Orders.
Also rust-proof and carbon steel available.

MARKWELL Manufacturing Co., Inc.
Established 1919
INDUSTRIAL PRODUCTS DIVISION Dept. 64
200 Hudson Street, New York 17, N. Y.

transistor oscillator, providing stable sine wave output voltages of 0, —13 and —16 DBM at 1,000 cycles into a 600-ohm line, has been announced by Stewart Bros.

It uses a push-pull transistor, LC circuit inductively coupled to the output terminals by a separate transformer winding.

The unit is 2¼ inches x 3 inches x 4 inches and weighs 10.3 ounces. It is

housed in a black molded bakelite case and is provided with both binding posts and telephone type plug for output connection.

The frequency variation is less than 4 per cent at ambient temperatures under 125° F and from a fresh to a discharged battery.

The output voltage variation is less than 4 per cent. Voltage output is mainly affected by changes in battery voltage.

The maximum wave form distortion is less than 3 per cent.

The self-contained mercury battery has a life of 700 hours with continuous operation and a much longer life with intermittent operation.

The Model J. Transistor Oscillator is designed for use in checking and locating trouble in carrier systems. Request NP519.

•

PLIERS—Mathias Klein & Sons now offers an improved spring plier utilizing a coil spring just below the hinge. This spring keeps the pliers open at all times. It has the advantage of being practically indestructible and is guaranteed for the life of the pliers, the company states. Because of its position, it leaves the inside of the handle area free from any obstruction. This permits any spring plier to be furnished with Klein custom dipped plastic handles.

The new spring is available on all

Klein pliers that have been offered in the past either with leaf springs or volute springs. Request NP520.

•

MATHEMATICAL CHARTS—Two new mathematical charts developed by E. J. George, Sun Oil Co. engineer, and distributed exclusively by Frederick Post Co., under the name "Calculine," provide a convenient, economical tool that can be used for the same purpose as a slide rule or calculating machine.

The charts, furnished on heavy 8½ inches x 11 inches card stock, consist of a log scale superimposed diagonally upon a log log grid. The multiphase mathematical chart includes scales for multiplication and division as well as those for obtaining directly the square root, cube root, and logarithm of a number.

The multiplication and division chart has the same pattern, but without the log, square and cube root curves.

Both Calculine charts contain examples illustrating the various mathematical operations which can be performed.

Values on the chart can be read directly without the use of a straight edge as required with a nomograph. An added feature of these charts is that the operator has a free hand to record values instantly as they are read.

E. J. George, also an instructor in chemistry at Drexel Evening College, originally devised these charts to meet the need of students for a convenient, accurate and inexpensive calculator.

Engineers find that these three-hole punched Calculine charts are useful for

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SEND TODAY FOR YOUR COPY OF THE NEW CATALOG ON
HOLAN'S 4401-H HYDRAULIC DIGGER
• New catalog shows how easy hydraulic hole-digging can be. No vibration to jar the operator . . . no complicated mechanical linkages that require maintenance . . . no damage due to stalling. Holan 4401-H digs holes 8″ to 20″ wide . . . 8′ deep.

J.H. HOLAN CORPORATION
4100 WEST 150TH STREET
CLEVELAND 11, OHIO
OTHER PLANTS: GRIFFIN, GA.; PHOENIX, ARIZONA; BRANTFORD, ONTARIO

To: J. H. Holan Corporation
4100 West 150th Street
Cleveland 11, Ohio

Please send me the factual technical bulletin about Holan's 4401-H Portable Hydraulic Earth Borer.

Name_____ Title_____
Address_____ Zone_____ State_____
City_____

field calculations, because they can be inserted in the back of notebooks for ready reference.

For administrative personnel, the charts can be placed under the glass desk top where they are ready for instant computation during telephone conversations as well as for numerous mathematical problems that arise during the day—thereby saving appreciable time consumed by other calculating methods.

Similarly, these charts constitute a convenient conference room aid. Request NP521.

•

SAFETY WHEEL BLOCK — A recently improved safety device, marketed by Calumet Steel Castings Corp. is the WB2H standard safety wheel block.

By use of stress analysis as well as other engineering and manufacturing

techniques, it has now been possible to produce an exceptionally strong, moderate sized, light weight, wheel block adequate for use with heavily loaded vehicles.

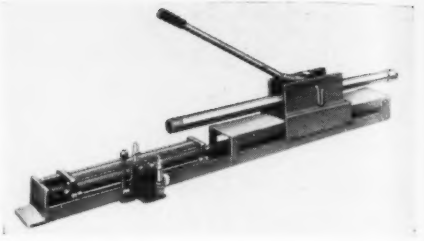
The WB2H is designed with rounded edges, stiffening ribs and supporting members, as well as integrally cast gripper teeth. The approximate over-all dimensions are 9 inches x 10 inches x 10 inches and weight is 14 pounds each. Provision is made for chaining to dock or vehicle.

These blocks are optionally available with owner's name cast on in raised letters when made up for specific orders.

Produced as an alloy steel casting, fully heat treated and finished in traffic yellow protective paint, they will last indefinitely protecting equipment and providing safe working conditions for personnel. Request NP522.

•

PIPE PUSHER—A completely powered, continuous 21 inch stroke conduit



and pipe pusher—Speed-Thru—is offered by Mercury Hydraulics, Inc.

The model A-40, handling ¾ inch to 3 inch conduit and pipe, has pushed, in certified performance, 186 feet of 2 inch pipe with less than 8 inches deviation, the company reports. It has recorded repeated performances of 75 feet under streets, highways and lawns in 18 to 20 minutes, through hard shale and hard pack road bed formations without change of power or speed, it is said.

Powered by gas engine, dc truck power or ac electric hydraulic power unit as desired, the pipe gripping carriage is given a 21-inch thrust. The conduit is snap released and the carriage is power returned to the starting position for the next stroke.

One man, operating two controls,

CABANISS-POGUE COMPANY
Consulting Engineers
Appraisals—Cost and Rate Studies
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P. O. Box 267 Jackson, Michigan

does the job with ease. The only manual labor connected with the operation is the installation of the machine. The pusher is easily portable.

By reversing the pushing principle Speed-Thru will pull conduit as rapidly as it pushes, expediting a new setting where underground conditions prevent satisfactory completion of a push. It is delivered complete, ready to push conduit or pipe, including the desired power unit, 25 feet hydraulic pressure and return hoses, quick couplers, dust caps and dust plugs. Request NP523.

Boyd, Warner Named Lenkurt Directors

Two well-known telephone executives have been elected directors of the Lenkurt Electric Co., manufacturer of multi-channel telephone and telegraph carrier and microwave equipment for the communications industry.

Thomas A. Boyd, senior vice president of General Telephone Corp., New York, and Leslie H. Warner, president of Automatic Electric Co., Chicago, were chosen directors at the annual meeting of Lenkurt stockholders on Apr. 10.

They fill vacancies on the Lenkurt board created by the resignation of former directors A. E. Carlson and Martin Lindsay, both of Automatic Electric.

Directors re-elected were the five Lenkurt officers: President, L. G. Erickson; executive vice president, Kurt E. Appert; manufacturing vice president, George F. Koth; commercial vice president, Philips B. Patton, and financial vice president, Kenneth R. Rickey.

Telephone Cable Facilities Expanded by Anaconda

The Anaconda Wire & Cable Co. announces that extensive equipment is now being installed for the production of paper-insulated, lead-covered telephone cable. It is anticipated that these new facilities will be in production during the second half of this year.

These facilities, together with expansion in the plastic telephone cable division, will round out a complete service to users of these types of products.

The services of personnel with long experience in the communication field have been obtained for this program. Additions have been made in both staff and field engineering, as well as the research and development departments.

Humanity in Practice

"Humanity always becomes a conqueror."—SHERIDAN.

it's dated

YOU CAN PROVE IT TO YOURSELF!

ALPHADUCT DUMBBELL TYPE
NEOPRENE JACKETED DROP WIRE

LASTS LONGER • COSTS LESS!

Every coil of ALPHADUCT drop wire is dated by means of a color coded thread which indicates the year it was manufactured. In this way, with no record keeping, no muss, fuss or bother, you can tell how long Alphaduct stays up without requiring service or replacement.

We know that our dumbbell type neoprene jacketed drop wire will last. It's tested thoroughly through every manufacturing stage. The tough neoprene jacket resists abrasion, moisture, sunlight, oil, water. The insulation sticks tightly to the conductor. The dumbbell or figure eight shape makes the wire easy to split, makes a neat installation.

You, too, may know all this for sure by trying Alphaduct drop wire. And . . . by dating the wire we make it easy for you to prove to yourself that this is the most sensible drop wire investment you've ever made.

IT'S DATED • FOR YOUR CONVENIENCE AND PROTECTION

ALPHADUCT WIRE AND CABLE COMPANY
MILLTOWN, NEW JERSEY

NATIONAL DISTRIBUTORS—LEICH SALES CORPORATION—CHICAGO, ILL.
REGIONAL DISTRIBUTORS—THE LINDSAY TELEPHONE SUPPLY CO., CLEVELAND, OHIO
PAHKEY SUPPLY COMPANY, CHARLOTTESVILLE, VA.

Magneto Exchange Specials

Western Electric 1240 D (NEW)

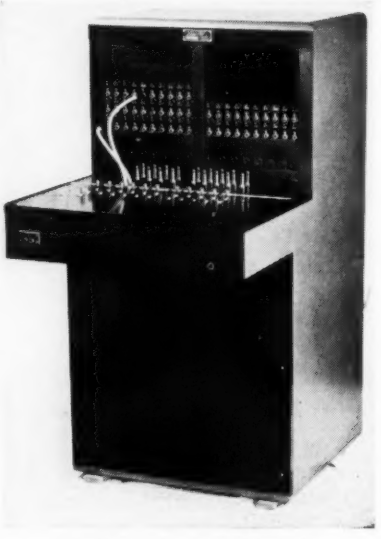
165 line—120 line equipped with plug-restoring drops & jacks—15 cord circuits (single-supervised) (cd. ckt. 1 to 5 equipped with 27A repeat coils & cut-out keys) night alarm ckt. wired for power ringing, with emerg. 5 bar hand generator—

Red Mahogany cabinet perfect condition—have been stored in original crate—inside—

3 only—with braid cable stubs $425.00
—wired to screw terminals 425.00
—line drops not wired 375.00

* *

W.E. #1800—ten drop sections #22C. 20.00
—unused, but discolored.. 10.00
#22C Drops on 89B mounting, new 10.00
W.E. #47 swbd. plugs, new ..... .50
on 5'-6' cord 1.00



Kellogg (actual photo)

Kellogg & Stromberg Carlson

←*(photo to left)*

New 100 line—50 equipped with combined drops & jacks, wired to 15' 51 pr. braid cable stub—Night alarm ckt. (no code alarm) 10 cord circuits (single supervised) with repeating coils. Standard-low type, 30" cordshelf (desk height) built for Navy—never used—Hardwood (birch or maple) cabinet, painted green.

Clean as a whistle—tested—
fully guaranteed $395

(as above, but slightly used, reconditioned $295)

Stromberg Carlson #11A Drops on 140 mtg. (5 per) with code & night alarm contacts (unused—A-1) per strip $15.00

Brand New $12.50 each in std. package of 8

Kellogg #5812 MX

5812 MX

5 bar, 1600 ohm, anti-sidetone circuit. Complete with F27 handset, coiled cord. Oak cabinet, painted dull green. New and perfect—original factory pack. (2500 or 1000 ohm ringer $1.50 extra.)

Less than 8, each $13.50

Western Electric

C1-E1

C-1 Handset hanger CB or LB E-1 Handset (F-1 transmitter) coiled cord & universal mtg. bracket. Rebuilt $6.60

300N

300N Ringer Box 5 bar—2500 ohm 1 mf condenser oak, painted OD Brand New $7.50
Battery Boxes—3 cell metal—Fibre Lined $0.50

202

202 Desk Set CB or LB E-1 handset (F-1 transmitter) oval base, use with 300N or CB ringer—box—Rebuilt $6.50
Round base type $6.00

OUTDOOR PHONES

325 Western Electric (F-1) CB less dial, new $25.00
reconditioned 17.50
Kellogg 4901—CB 15.00
4900—CB 20.00
4883—LB 17.50
Auto Elec.—CB 15.00
Explosion Resistant—A.E. #ETG 51 AD-5 bar with 1600 ohm bell, new.. 75.00
exp. res. bell, 6" 2-gong 15.00
Mine type—W.E. 1336 J 35.00
Water-tight bell, North 10.00
Galv. phone housings 15.00
Marine ship types—

PIECE PARTS — huge stock new parts for older phones priced low —to clear

CORDLESS SWITCHBOARDS

LB & CB & Comb. W.E. 506B special, 12 CB line 2 CB & 3 LB trunks, like new $200.00
W.E. 506—7 CB line—3 CB trunk reconditioned thru-out, oak 150.00
Kellogg LB lamp type 20 line 200.00
(Photo on request) 12 line 150.00
50 line Magneto Lamp, wall type-operated from 115 volt AC, 10 cord circuits—Navy type, new—ideal PBX hotel, etc.—LB phones or CB (with kick coil)—photo & description on request 175.00

"KICK-COILS" (CB phones to LB SWBD)

KELLOGG

C-111

Ring-thru, 4 section (50 ohms each) 1:1 ratio. Ideal for connecting CB phones to Mag. board using common battery supply.

Also may be used for ring-thru LB cord circuits, isolation, etc.

1¾" x 3¾" x 5¼" (2¾" mounting stud centers) Brand New $3.00
lots of 10, per coil 2.75
lots of 50, per coil 2.50
Mounting strip (10 coil) for 19" rack .. $2.50
Repeating Coils—most types

50,000 new relays in stock—switchboard parts — most types. Let us quote on your needs.*

Telectric

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Shipped on approval—we pay two-way freight if you are not entirely satisfied.

Protection at ½ or Less

MDF TYPES

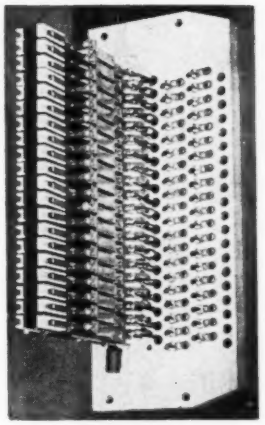
Western Electric

1435 W, 20 pair group consists of: #1269 A, 20 pr. prot. group complete with #76A heat coils, #26 & #27 dischargers, mounted on maple screw-terminal base—for wall mounting.

New—original factory carton—

A-1 ..... $15.00

(Note: By removing 2 bolts you have a standard #1269A group)



1435 W

1435 U, 20 pr. fuse groups, new, with 7A, 7 amp. fuses $5.00

MDF 1420 B, iron frame for mtg. ten 1435 W or U gps. floor type (against wall) 6½' high, 18" wide. New—(sold with order for prot. grps. only) $10.00

1269 A (W.E.) 20 pr. (see 1435 W above) fully equipped.
New $15.00
Reconditioned like new, fully equipped 10.00
1268 A (reconditioned only) 10.00
C 50 A (W.E.) 50 pr. (⅜" centers) equipped with #28 & #29 discharge blocks & #76A heat coils—New 47.50
Reconditioned like new 35.00
C 52 A, 52 pr. New $49.00—reconditioned 37.00
C 25 A, 25 pr. New 20.00—reconditioned (½ of C-50) 15.00
#675 (A.E.) 20 pr. (½" centers), equipped, new 12.50
Reconditioned 10.00
#100 (Cook) 20 pr. (½" centers), equipped, reconditioned 15.00
23 pr. as above 16.50
#3800—101 pr.—New $100.00 reconditioned 75.00

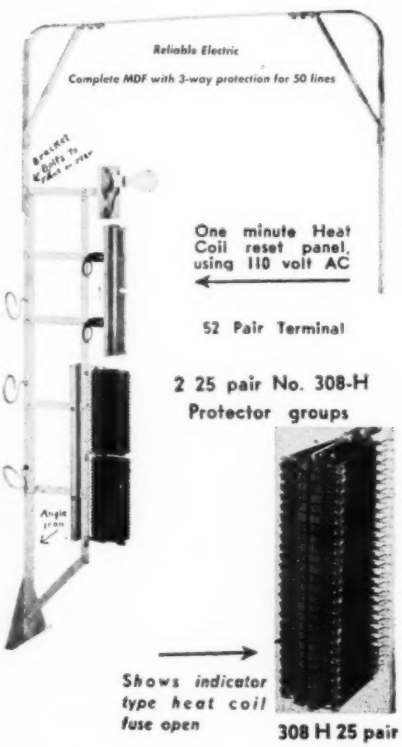
Open Wire & Cable Protection

W.E. #84A, 5 pr. block equipped with #26 & #30 discharge blocks (or 26 & 27), new $2.75
Less blocks, new 1.00
Ideal for protecting pole mtg. phantom repeating coils.

W.E. #83A (#84A in wp. mtg. box, equipped as desired) 5.00

TERMINALS, Cable (All New)

W.E. LA 16, with lead stub, protected, with cabinet, new $30.00
Equipped with 7A (7 amp.) fuses, #26 & #27 blocks 35.00
LA 26, with lead stub, less cabinet, new 25.00
Equipped with 7A fuses, #26 & #27 discharge blocks 32.50
LB 26, with in & out lead stub, less cabinet (2 only), new 25.00
Equipped as above 32.50
Cook S-6, 16 pr. with lead stub, H-20 protection, new 24.50
Transmount equipment in stock at reduced prices (write)
Cook M-16, 51 pr., with stub $15.00
Cook, Uniflex, 51 pr., with stub 12.50
W.E. B 26, with stub (Binding post chamber) 12.50
B 51, with stub (Binding post chamber) 17.50
B 101, with stub (Binding post chamber) 24.50
E 51, with stub (Binding post chamber) 17.50
EA 51 pole box 19.50
F-16 with stub 12.50
F-26, with stub 17.50
H-51, with stub 16.00
G-51, with 6 ft. stub 15.00


Reliable Electric
Complete MDF with 3-way protection for 50 lines
One minute Heat Coil reset panel, using 110 volt AC
52 Pair Terminal
2 25 pair No. 308-H Protector groups
Shows indicator type heat coil fuse open

308 H 25 pair

Shipping weight 77 lbs. **Complete 39.50**

Reliable, 50 pr. complete as shown, with MDF $39.50

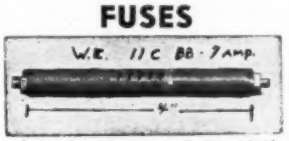
308H (Reliable), 25 pr. grp. fully equipped, new $10.00

Substation Types

98A (W.E.) new (fob N.Y. or L.A.) $1.00
93 AW (W.E.) 98A in wp. mtg. can, new 2.00

Cook—similar to 0-9 type outside, with H-20 protector unit equipped A-9 5 amp. Tru-Blo lavite fuses, also has jack (W.E. 223) for use with #47 plug. Size: 2"x3"x7" high, with bracket.
Cook cat. No. 523-1, pole jack, new $1.50
Less prot. #523-51, pole jack, new .50
(sample on request)

FUSES



(Used with 98 A & 93 AW)

11 C, sealed can of 20, new $1.25
5 cans 5.00
7T-BB, 7 amp. for B box, new ..... .10

Fuses—indicator (grasshopper type) for swbd.
35 A (W.E.) 1⅓ amp. ..... $ .10
Per hundred 9.00
(Others, same type, lesser quantities)
Fuse Mountings—1 to 80 CKT types (write)
(W.E.) HEAT COILS, 76A, new ..... $ .10
(W.E.) Discharge Blocks, #26 & #27, new, pr. (one of each) ..... .10

Distributing Frames

W.E. #1425 Type—6 ft. (like new). 1 to 5 verticals—each vertical mounts 100 pair ½" center prot. grps. or 150 pair ⅜".
Per vertical, with dist rings, fanning strips ..... $ 25.00
5 vertical—welded one unit, 32" wide 100.00
Cook L Type 2 vert. 101 pr. each 6'6" $50.00
Wall Brackets & Frames (many types)
MDF Wood Terminal Blocks, New, 6¢ pr.

Relay Racks

W.E. 19" 7', pedestal base $25.00
19" 12', pedestal base 40.00
19" 12", no base 30.00
23" Various heights
Kellogg—26", 7' 30.00
Power equipment Racks
(Write of your needs)
Repeating Coils—Relays, Keys
(Most everything for your plant)
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Richmond 8-2249

XUM

Van Zandt To Represent IT&T in Far East

Howard F. Van Zandt, assistant vice president of the International Standard Electric Corp., until the beginning of this year assistant sales manager of the Kellogg Switchboard & Supply Co., is being transferred in May to Tokyo, Japan, where he will be Far Eastern representative of International Standard Electric, a subsidiary of International Telephone & Telegraph Corp.

In his new capacities, Mr. Van Zandt will represent the American and foreign manufacturing, and research and development divisions of the IT&T, including Kellogg, in the Far Eastern countries. The factories, laboratories, and foreign trading companies of IT&T employ over 80,000 people and include 34 manufacturing and laboratory companies in 19 countries. IT&T is the largest American-owned international enterprise engaged in the development, manufacture, sale and installation of electronic communications equipment, the operation of telecommunications services, and the granting of patent licenses and technical aid in those fields.

In Japan are two associate licensee companies, the Sumitomo Electric Industries, Ltd., and the Nippon Electric Co., Ltd., in whose Tokyo headquarters building Mr. Van Zandt's office will be located.

H. F. VAN ZANDT

Prior to joining the Kellogg company in 1951, Mr. Van Zandt spent five years as a member of the civil communications section of General MacArthur's occupation staff. He advised on the rebuilding and reform of Japan's telephone system during this period. He returned to the United States in 1951 and joined Kellogg on June 1 of that year.

Mr. Van Zandt returned to the Far East on business in 1952, 1953, 1955, and early in 1956. The sale of Kellogg Crossbar and toll switchboard equipment at Takasaki, Kuragano, and Annaka was made under his direction. While in Japan in 1952, he spoke formally in the Imperial Diet—in Japanese—an unparalleled experience for an Occidental.

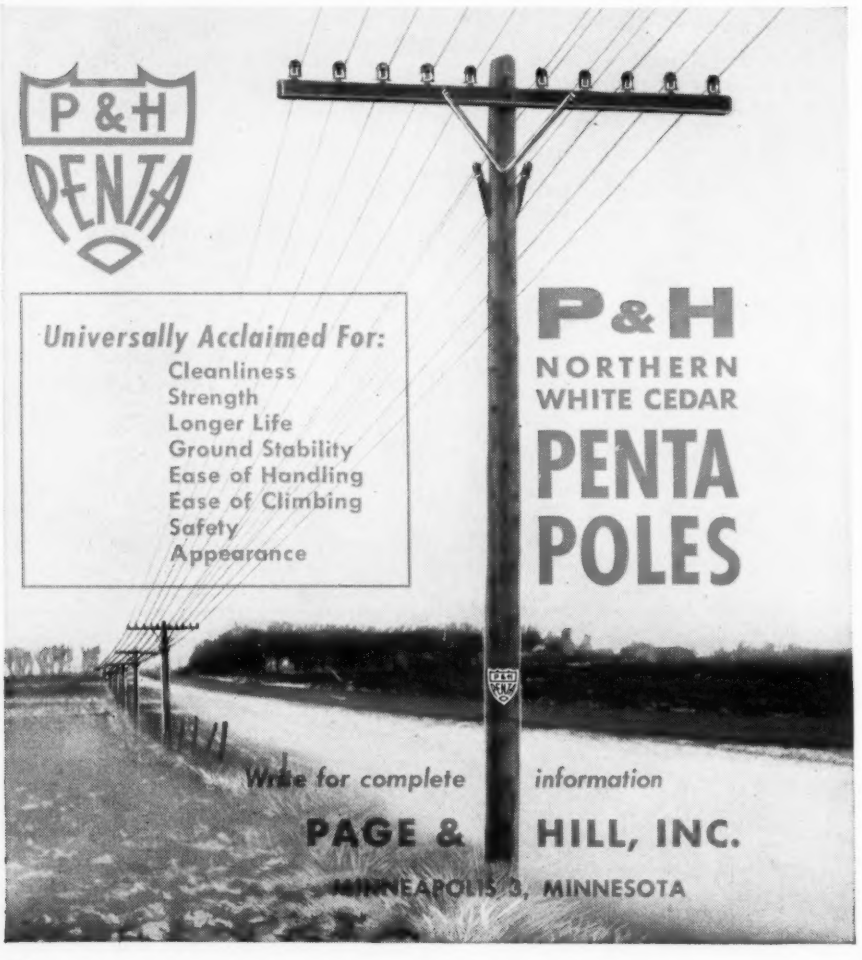
A native of Chicago, Mr. Van Zandt first went to Japan in 1918, where his father was chief engineer of the Asano Cement Co. These years spent in Japan with his family enabled him to master the Japanese language.

He returned to the United States, and in 1929, after being graduated from the University of Oklahoma with a Bachelor of Science Degree, joined the Southwestern Bell Telephone Co. He attended the university's graduate school on a part-time basis for four years and was awarded his Master's Degree in History in 1937, specializing in East Asia. During World War II, he taught courses in the Japanese language for the University.

He has written over 100 magazine articles, as well as innumerable newspaper articles, dealing with East Asia, Europe, North Africa, and the United States. He has given over 1,000 lectures, most of them dealing with the Orient, telephony, American colonies, etc.

(Mr. Van Zandt was the author of a popular series of seven articles appearing in TELEPHONY *early in 1951, entitled "Japan's Recovery and Telephone Service." These articles attracted widespread interest in U. S. government circles and throughout this country and the Far East. They were reprinted to meet the great demand for copies from all parts of the world.)*

Mr. Van Zandt's wife and daughter will move to Japan late in May. Since returning from Tokyo in 1951, Mrs. Van Zandt has been popular in Chicago as a lecturer on the Far East.



Stromberg Quits TV; Sells Broadcasting Properties

The manufacture of television receivers has been suspended by Stromberg-Carlson, a division of General Dynamics Corporation, it was announced on Mar. 30 by Robert C. Tait, president.

However, the company will continue in the consumer products business, he emphasized, manufacturing and merchandising through established trade channels its complete line of radiophonographs and high fidelity equip-

ment. The company is now expanding production of its famous Custom Four Hundred High Fidelity combination radio-phonographs and other high fidelity products, including AM-FM tuners, amplifiers, loudspeakers and other units for home installations, Mr. Tait said.

The decision to suspend the production of television receivers was reached after more than a year of careful study, and after a fact-finding survey of the field by an independent research organization, Mr. Tait said. The decision was actuated by an increasing demand on Stromberg-Carlson's facilities as a designer and producer of electronics equipment for manifold industrial and government applications, he explained.

"At the same time the rapid growth of our telephone, government and sound equipment business has resulted in an acute space problem which has been only partially solved by the expansion of leased space in Rochester, and by the recent start of our 5 million dollar building program, scheduled for completion in 1957.

"Furthermore, there are in our research laboratories and engineering departments a number of projects, in various stages of development, that we are confident will open up still larger markets for our products in the fields of communications and electronics.

"It is anticipated that profit potentialities will be much stronger for Stromberg-Carlson in these fields, and we have decided to concentrate our efforts in those areas where we can foresee more satisfying returns. We believe this decision is in the best interests of the company's future, and the security of our 6,000 employes," Mr. Tait stated.

On Apr. 2, the sale of the broadcasting properties of Stromberg-Carlson to the Transcontinent Television Corp. of Buffalo, N. Y., was announced jointly by Mr. Tait, and David C. Moore, president of Transcontinent. The transfer is subject to the approval of the Federal Communications Commission.

The sale includes Stations WHAM, WHFM, and WHAM-TV, and the physical properties of the stations—Rochester Radio City, the station's television transmitter, all in Rochester, N. Y., and the radio transmitter in Brookdale, near Scottsville, N. Y.

Joining with Transcontinent in the acquisition of these properties is the General Railway Signal Co. of Rochester.

Rock-bottom maintenance costs—the aim of every on-the-ball plant executive—come when you buy the drop wire that stays up, year after year, storm after storm.

NEOPRENE!

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TELE-WIRE SUPPLY CO., INC.

146 FRONT STREET

NEW YORK 5, N. Y.

****STRAND:** 1/4"—Messenger, 7 wire, 4000 lb., Spec. Grade on

2500 ft. reels ..... $36.50/M ft. Delivered

11,000—50,000 ft. ..... $35.25/M ft. Delivered

5/16"—Messenger, 7-wire, Galvanized, Utilities Grade, 6000 lb., on

2500 ft. reels ..... $53.25/M ft. Delivered

10,000—50,000 ft. ..... $49.75/M ft. Delivered

Over 50,000 ft. ..... $47.50/M ft. Delivered

Terms: 1% 10 days, Net 30; FOB Destination, We Pay Freight.

****LINE WIRE:** Galvanized, A coating, Specification Grade, 1/2 mile coils—

#12BWG—HTL 85 grade

up to 4,000 lbs. ..... $15.52/cwt Delivered

4 M—10,000 lbs. ..... $15.27/cwt Delivered

Over 10,000 lbs. ..... $15.12/cwt Delivered

#14 BWG—ditto ..... Same price schedule as #12

Terms: 1% 10 days, Net 30; FOB Destination, We Pay Freight.

****JOSLYN POLE LINE MATERIALS, HARDWARE, SUPPLIES** — A complete line of hardware — Poles — Crossarms — Braces — Insulator — Brackets — etc.

****CABLE SPINNERS:** Factory Reconditioned, FULLY GUARANTEED, *LIKE NEW!*

General Machine Products Model "B" — Complete With Chest and NEW Pull Rope—Uses Lashing Wire .061, .091.

PRICE ..... $198.00 Each; DELIVERED!

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PRICE ..... $228.00 Each; DELIVERED!

TERMS: 2% 10 Days, Net 30; FOB DESTINATION. SHIPPED EXPRESS PREPAID.

****ANKOSEAL TELEPHONE CABLE**—Large STOCK of various lengths and sizes.

—REEL Lengths also available.

type 775-P, 775-P-SS, and Inside Wiring Cable with new type Zip-Rip wire.

—RURAL DISTRIBUTION CABLE — 3 pair, 6 pair, 11 pair, 16 pair type PE-V, color-coded with insulated support wire. — IN STOCK.

—URBAN DISTRIBUTION CABLE—16 pair, 24 ga., color-coded with insulated support wire. — IN STOCK.

—Accessory items for Rural Distribution cable such as the Pole Brackets, Wire-vises, Wirelinks, Plastic Guards, etc. — IN STOCK.

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CABLE SPLICERS, Station Installers, Linemen. Experienced men needed. Steady work, good pay. Henkels & McCoy, 6100 N. 20th, Philadelphia, Pa.

WANTED TELEPHONE INSTALLERS, CABLE SPLICERS, LINEMAN. Steady work—Union wages. Yates Construction Company — Telephone 2-4623, Paducah, Ky.

COMBINATION MAN with at least four years experience in installation and maintenance of automatic dial outside plant. Prefer one with some experience in maintenance of Stromberg X-Y C.O. equipment. Write J. B. Mobley, manager, Santa Fe Telephone Co., P. O. Box 351, Melrose, Fla.

SALES ENGINEER WANTED: telephone engineer with broad, general background in equipment and outside plant engineering to assist sales force in technical problems. To locate in Ohio with thirty per cent of time in field. Excellent future. Salary commensurate with experience. Reply to Box No. 3816, c/o TELEPHONY.

INDEPENDENT—1200 STATIONS—30 miles from Kansas City, converted to Kellogg 7-3 Cross Bar, needs a man with experience both dial equipment and outside plant maintenance, some construction. Please state age, experience, salary expected and give references in first letter. Address inquiry to Suburban Telephone Company, Inc., Tonganoxie, Kans.

CABLE MAN with ability to install new cable, shoot trouble, and maintain cable in plant. Permanent job. Good opportunity for man wanting to be home every day. Write Box No. 3817, c/o TELEPHONY.

EXPERIENCED INSTALLER REPAIRMAN wanted by Class A northern California company. Permanent position, excellent pay, benefits and working conditions. Apply stating past experience to Box No. 3822, c/o TELEPHONY.

CABLE SPLICERS • LINEMEN
STATION INSTALLERS
STEADY WORK, GOOD PAY.
MIDWEST LOCATION.
The Weikel Line Company, Inc.
FORT WAYNE, IND.

POSITION WANTED

MANAGER DESIRES TO RELOCATE—2000 stations and up. Have the ability to take complete charge. Plant, Commercial, Traffic. Can engineer plant for dial conversion. Write Box No. 3820, c/o TELEPHONY.

WANTED TO BUY

Telephone Test Equipment—
Splicer tones, Amplifiers;
Lineman's Dial Test Sets
in good condition.
Henkels & McCoy
6100 N. 20th St., Philadelphia, Pa.

TELEPHONES—all types—any condition. Write stating quantities and types. Our truck will pick up within 300 mile radius of Scranton, Penna. Write Box No. 3765, c/o TELEPHONY.

SMALL INSTALLATIONS AND REHABILITATIONS of all types of C. O. Equipment. Preferably in the state of Wisconsin. Write Box No. 3818, c/o TELEPHONY.

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MODEL JC-1 RECORDAK JUNIOR MICROFILMER 3½ years old, in perfect operating condition, Pinconning State Bank, Pinconning, Bay County, Mich.

NORTH CX-200-300 DIAL SWITCHBOARD. 300 lines, 11 trunks loop dialing, 13 paystation lines, 26 links, 1, 2, 4 and 10 party synchromonic ringing. Equipment includes test board and M. D. F. Will be available April 1. A real bargain f.o.b. our building. Telephone or write Sandhill Telephone Company, Aberdeen, N. C.

FOR SALE

FOUR HUNDRED GOOD USED 10 PIN CROSS ARMS. Write Webster Springs Telephone Co., Oak Hill, West Virginia.

20-CYCLE RINGING POWER

Subcycle, Model M.7.5.....@ $20.00
Subcycle, Model B. Large...@ $30.00
Telkor-Telering, Model H....@ $15.00
Kellogg Pole Changer, #41-PC. 24-Battery Volt Input, 100-volt Output.

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W.E. #5H Dials, $4.00 ea., lots of 25 to 49—$3.50 ea., 50 to 100—$3.00 ea. Rebuilt.
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REBELCO handset conversion kits. F-1 handle, cover plate, 4 cond. cord and saddle....$7.50
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1	Automatic Electric Co. 5 Freq. Convertor	200.00
2	M 7.5 Sub Cycle Convertors	15.00
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12	Stromberg 1-A Plates	20.00
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1100	#1-114 Nicopress Sleeves (New) Per 100	2.00
1000	#3-064B Nicopress Sleeves (New) Per 100	1.50
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1500	#7454 Hubbard Servisleeves 3/8" New Per ea.	.05

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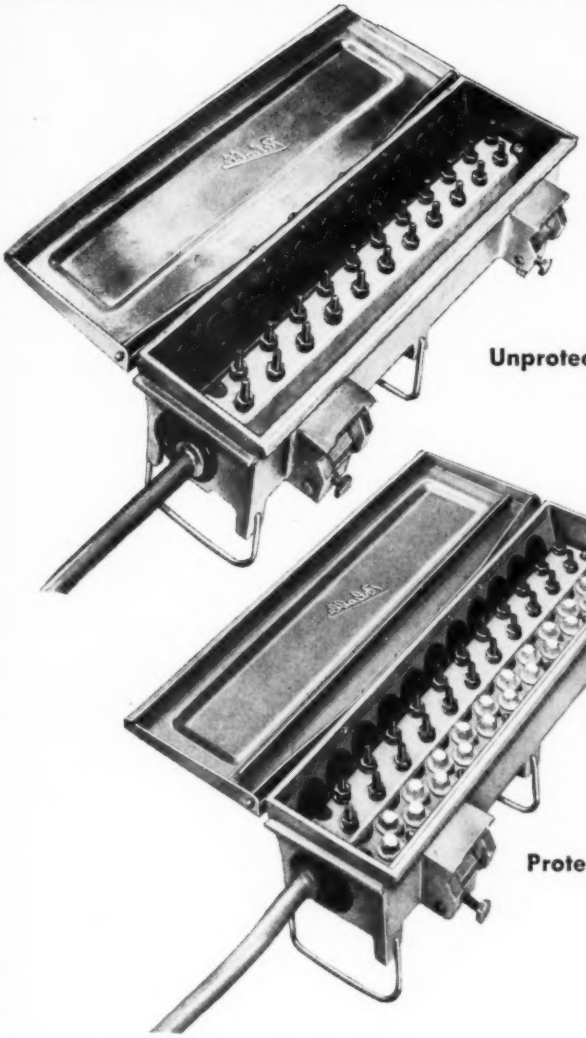

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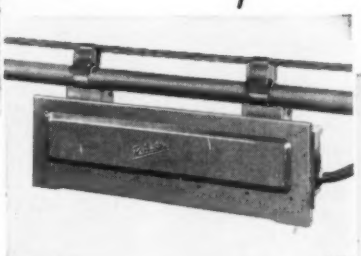

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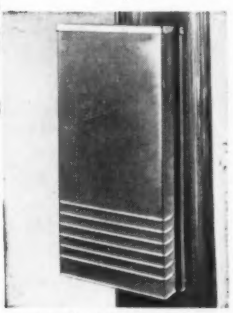

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